Anas SpA

Direzione Centrale Progettazione

PROLUNGAMENTO DELLA S.S. n ° 9 "TANGENZIALE NORD di REGGIO EMILIA" NEL TRATTO DA S. PROSPERO STRINATI A CORTE TEGGE

PROGETTO DEFINITIVO

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VISTO: IL RESPONSABILE DEL PROCEDIMENTO	*VISTO: IL RESPONSABILE UNITA' DEL COORDINAMENTO*		*PROTOCOLLO*	*DATA*
ing. Angela Maria Carbone	ing. Nicola Dinnella			

07_IDROLOGIA E IDRAULICA
RELAZIONI

RELAZIONE IDROLOGICO E IDRAULICA
GESTIONE ACQUE DI PIATTAFORMA

CODICE PROGETTO			*NOME FILE*	*REVISIONE*	*SCALA:*
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A	EMISSIONE	settembre 2013	ing. N.Mammi	ing. R.Telò	ing. A. Burchi

I N D I C E

1. PREMESSA

La presente relazione, parte integrante del Progetto Definitivo del "Prolungamento della Tangenziale Nord di Reggio Emilia tra S. Prospero Strinati e Corte Tegge" analizza, approfondisce e descrive le opere funzionali alla corretta gestione delle acque di scarico generate dalla piattaforma stradale compatibilmente con la capacità recettiva dei corsi d'acqua riceventi.

La realizzazione dell'opera, comporta, infatti, l'impermeabilizzazione delle superfici di piattaforma stradale con conseguenti problematiche connesse alla gestione delle acque meteoriche drenate sia da un punto di vista quantitativo che qualitativo.

Il criterio guida di impostazione, che tiene conto delle prescrizioni impartite durante la Conferenza dei Servizi sul Progetto Preliminare e quanto prescritto da ANAS riguardo il Progetto Definitivo, prevede che il sistema di raccolta, smaltimento e trattamento delle acque di piattaforma sia di tipo chiuso.

Esso comprende:

- reti interconnesse di raccolta ed evacuazione delle acque di piattaforma;
- presidi di sicurezza per il controllo degli sversamenti accidentali;
- impianti tecnologici per il trattamento delle acque di prima e seconda pioggia;
- fossi e bacini di laminazione per il controllo delle portate rilasciate che svolgono anche la funzione di zone di riequilibrio ecologico.

Per il corretto dimensionamento di tali opere, è stato individuato il migliore assetto da assegnare al sistema di drenaggio tenendo conto:

- delle sollecitazioni pluviometriche;
- dei vincoli normativi;
- della particolare situazione morfologica e idraulica delle aree interessate dall'infrastruttura stradale;
- dei vincoli quantitativi dei canali recettori imposti dal Consorzio;
- della funzionalità del sistema di trattamento delle acque.

Infatti, la realizzazione della tangenziale produce essenzialmente due principali problematiche:

- potenziale incremento delle portate idrauliche consegnate ai ricettori, a seguito dell' incremento dei coefficienti di deflusso;
- alterazione della qualità delle acque meteoriche, che si deteriora dal dilavamento del manto stradale a tal punto che il problema del trattamento delle acque assume un'importanza analoga a quella del trattamento degli scarichi dei reflui civili ed industriali. Infatti il dilavamento di superfici scoperte non si esaurisce con le acque di prima pioggia bensì si protrae nell'arco del

tempo in cui permangono gli eventi piovosi. Le acque meteoriche di dilavamento si qualificano a tutti gli effetti come "acque di scarico" da assoggettare alla disciplina ed al regime autorizzativo previsto dal DLgs 152/2006 e seguenti.

Queste conseguenze possono essere controllate attrezzando l'opera stradale con sistemi di raccolta di tipo chiuso con consegna della frazione inquinata agli impianti di trattamento, in qualunque condizione di pioggia: intensa e di breve durata (1-3-6 ore) o prolungata nel tempo (9-12-24 ore) per TR=50 anni.

2. CRITERI PROGETTUALI ED ARTICOLAZIONE DELLO STUDIO

I criteri progettuali assunti nel presente PD, derivanti dai numerosi incontri con i diversi attori per la gestione delle acque e dal rispetto di un assetto agronomico consolidato in centinaia di anni, sono i seguenti.

- progettazione della rete di drenaggio delle acque della piattaforma stradale verificata secondo le prescrizioni presenti nel Capitolato d'Oneri ANAS per TR=25 anni, ma comunque dimensionata per tempo di ritorno TR=100 anni;
- progettazione dei fossi di guardia dell'asse principale dimensionati per tempo di ritorno TR=50 anni;
- non interferenza con la rete dei canali irrigui;
- non interferenza con i canali arginati Modolena, Quaresimo e Fossetta della Torretta e con il Torrente Crostolo;
- non interferenza con i canali promiscui ma già sofferenti come ad esempio la Fossetta Ballanleoche;
- garantire sempre e ovunque la continuità idraulica dei campi sia ai fini di scolo che irrigui a monte ed a valle della infrastruttura stradale in progetto;
- riduzione massima delle stazioni di sollevamento come prescritto da ANAS;
- azzeramento dei sifoni che portano sempre numerosi problemi gestionali;
- rispetto del coefficiente udometrico di scarico nei canali recettori, imposto dal Consorzio di Bonifica;
- garantire il volume di laminazione minimo pari a $500m^3/ha_{imp}$ rispetto alla superficie impermeabilizzata dalla piattaforma stradale, tramite invasi di laminazione, fossi di guardia e tombini idraulici di collegamento,
- prevedere che ogni scarico sia dotato di manufatto di modulazione della portata e di depurazione delle acque per l'asse principale della tangenziale, mentre per le viabilità secondarie rappresentate dalle rampe, dai sottovia e dalle strade di collegamento lo scarico avviene direttamente nel corpo idrico recettore, previa modulazione della portata;
- invarianza di bacino afferente: non si può scaricare in un fosso o canale acque a lui non deputate originariamente.

Propedeutico al presente PD è stato condotto uno studio idrologico e quindi idraulico sulla rete di raccolta, laminazione, trattamento ed evacuazione delle acque di piattaforma attraverso le seguenti fasi:

1) individuazione dei recettori e dei loro limiti di portata scaricata;
2) analisi idrologiche: preliminarmente sono state ricavate le curve di possibilità pluviometrica caratteristiche per ogni ambito territoriale da utilizzare nel dimensionamento degli afflussi che sollecitano la rete, quindi si è proceduto alla trasformazione Afflussi/Deflussi tramite utilizzo di modellazione matematica;
3) schema idraulico di funzionamento delle reti di raccolta, smaltimento e trattamento: comprende

l'individuazione dei manufatti elementari del drenaggio di piattaforma ed il relativo dimensionamento in funzione dei parametri di progetto assunti; comprende anche l'individuazione dei tratti omogenei e dei bacini ad essi afferenti;

4) verifiche idrauliche: comprende il dimensionamento dei fossi di guardia e l'impatto dello scarico delle acque di piattaforma con i limiti allo scarico imposti;

5) dimensionamento dei manufatti di evacuazione, modulazione, laminazione e trattamento.

I metodi di calcolo e di analisi adottati sono sinteticamente riportati nei singoli paragrafi, mentre si rimanda alla bibliografia di settore per gli approfondimenti teorici ed applicativi.

3. RIFERIMENTI NORMATIVI E TECNICI

Le analisi idrauliche, di seguito riportate, sono state condotte rispettando gli indirizzi e le prescrizioni riportate nella normativa di riferimento nazionale, interregionale e regionale

Lungo tutto lo sviluppo dell'analisi e della progettazione idraulica in oggetto ci si è, inoltre, attenuti e riferiti a tutto l'insieme di indicazioni e prescrizioni (Norme di polizia idraulica) impartite dal Consorzio di Bonifica dell'Emilia Centrale, con il quale è stato attivato un positivo confronto.

3.1. NORMATIVA NAZIONALE

1- Circolare Ministeriale LLPP n° 11633 del 7 gennaio 1974 "Istruzioni per la progettazione delle fognature e degli impianti di trattamento delle acque di rifiuto".

2- Decreto Legislativo 152/99 e la successiva modifica costituita dal D.Lgs 258/00, in cui le acque di "*prima pioggia*" sono affrontate all'Articolo n. 39

3- Testo Unico sulle Opere Pubbliche di cui al Regio Decreto 25/7/1904 n.523.

4- L. 36 del 05/01/1994 "Tutela e uso delle risorse idriche"

5- D.Lgs. 3 aprile 2006 n.152 "Norme in materia ambientale" e successive modifiche e integrazioni;

6- DM 14/01/2008 "Norme Tecniche per le costruzioni"

7- Circolare 2/02/2009 n.617 "Istruzioni per l'applicazione delle Nuove tecniche per le costruzioni" di cui al DM 14/01/2008.

3.2. NORMATIVA REGIONALE/INTERREGIONALE

1- Delibera di Giunta Regionale della Regione Emilia Romagna n.286 del 14/02/2005 "Direttiva concernente indirizzi per la gestione delle acque di prima pioggia e di lavaggio da aree esterne - Art.39 D.Lgs 11/05/1999 n.152";

2- "Linee guida delle acque meteoriche" approvate con atto di G.R. n. 1860 del 18.12.2006;

3- Legge Regionale n.4 del 6 marzo 2007;

4. DESCRIZIONE DEL TRACCIATO STRADALE AI FINI IDRAULICI

Il tracciato del prolungamento della Tangenziale Nord di Reggio Emilia si sviluppa da Est verso Ovest per circa 6.4 km in territorio di alta pianura, la cui morfologia si presenta monotona deprimente verso Nord-Ovest e sulla quale si evidenziano alcuni rilievi naturali costituiti dai dossi di pianura. Questi, in genere, hanno orientamento nord-sud, e sono originati dalle antiche esondazioni dei corsi d'acqua e dalle fluttuazioni d'alveo che hanno modellato la pianura in alternanza di dossi e valli, oggi non sempre riconoscibili, i primi caratterizzati da suoli sabbiosi e talvolta ghiaiosi le seconde caratterizzate da depositi alluvionali di limi ed argille. Altri elementi di rilievo di origine artificiale sono le arginature dei principali corsi d'acqua e dei rilevati infrastrutturali e le incisioni dei canali di scolo e bonifica.

Gli elementi morfologicamente più significativi sono i corpi idrici principali attraversati dalla tangenziale: il Torrente Crostolo, Modolena e Quaresimo che suddividono il territorio in ambiti idrologicamente omogenei, tutti appartenenti al Comprensorio di Bonifica dell'Emilia Centrale.

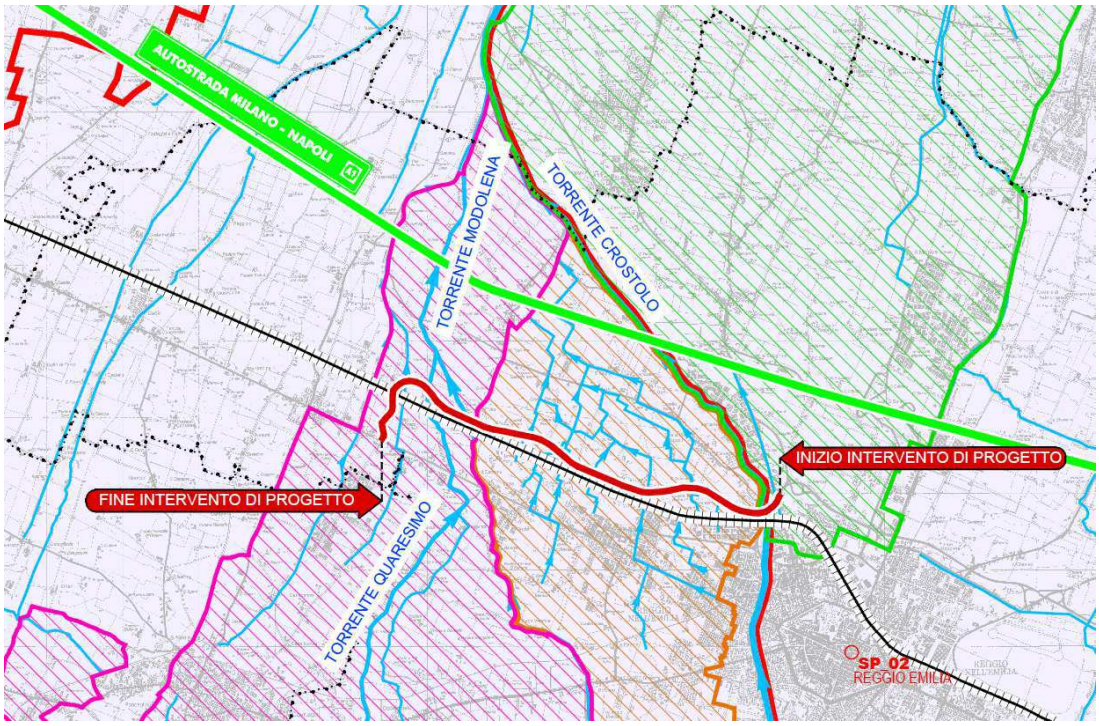


FIGURA 4-1: PLANIMETRIA DI INQUADRAMENTO DEL TRACCIATO STRADALE

La viabilità in progetto si raccorda ad Est all'esistente cavalcavia della tangenziele Nord di Reggio Emilia, circa all'altezza di Via dei Gonzaga, mentre a Ovest a via G. Vico in località Corte Tegge.

La tangenziale in progetto è di categoria B, con due corsie per senso di marcia, fino al Km 04+300, dopodichè si passa alla categoria C1 con una sola corsia per senso di marcia.

Il tracciato è prevelentemente in rilevato con la presenza di tre ponti per l'attraversamento dei corsi d'acqua principali interferiti e di due viadotti, il primo all'inizio dell'intervento, denominato "Viadotto a Est del T.

Crostolo", che si collega con il cavalcavia esistente, ed il secondo, denominato "Cavalcavia Gallinari" per il superamento dello svincolo di Pieve Modolena.

Dal Km 05+570 al Km 05+950 il tracciato si sviluppa in trincea, denominata "Trincea di Corte Tegge", che presenta una profondità massima di circa 4.30m rispetto al piano campagna circostante.

In generale, per l'intera tangenziale, la pendenza trasversale massima della strada è pari al 7% in curva, mentre in rettifilo è sempre garantita la pendenza almeno del 2,5% per consentire il corretto deflusso delle acque di piattaforma.

Il progetto stradale in esame contempla, oltre alla tangenziale, anche viabilità secondarie, tra cui due svincoli denominati "Svincolo di Rete2" e "Svincolo di Pieve Modolena" costituiti da rampe di collegamento tra la tangenziale e la viabilità esistente. Oltre a questi due svincoli sono previsti sei sottovia che hanno la finalità di superare la tangenziale o l'esistente linea ferroviaria MI-BO. Infine sono presenti una pista ciclabile nell'area dello svincolo di Rete2 ed alcune nuove viabilità di collegamento di strade esistenti, tra cui il raccordo tra Via Guernica e Via Hiroshima.

5. INDIVIDUAZIONE DEI RECETTORI E DEI LIMITI DI PORTATA

Il reticolo idrografico interferito dall'asse stradale è costituito da una fitta rete di canali artificiali gestiti dal Consorzio della Bonifica dell'Emilia Centrale, mentre quelli di modeste dimensioni sono fossi privati. Nella parte EST del tracciato e proprio in corrispondenza con l'innesto alla tangenziale NORD, la nuova struttura stradale sovrappassa il torrente Crostolo, unico corso d'acqua gestito da AIPO.

La scelta dei corsi d'acqua riceventi le acque di piattaforma, pur accettando l'ipotesi dell'invarianza idraulica e della totale depurazione, è stata suffragata da una serie di considerazioni che hanno poi trovato conforto in uno stretto rapporto con il Consorzio di Bonifica dell'Emilia Centrale. I criteri guida che hanno veicolato tale scelta, e come già anticipato nel Capitolo precedente, trovano conforto nel rispetto dei seguenti requisiti:

- non interferenza con la rete dei canali irrigui;
- non interferenza con i canali arginati Modolena, Quaresimo e Fossetta della Torretta e con il torrente Crostolo;
- non interferenza con i canali promiscui ma già sofferenti come ad esempio il canale Ballanleoche;

In definitiva, ed in realtà non potendo fare diversamente, i corsi d'acqua scelti per poter ricevere le acque drenate dalla piattaforma stradale sono i seguenti:

Tabella 5-1:Corpi idrici interferiti e limiti allo scarico per il tracciato stradale

TANGENZIALE NORD DI REGGIO EMILIA nel tratto da San Prospero Strinati a Corte Tegge				
NOME RILIEVO	GESTORE	RANGO	POSSIBILITA' DI SCARICARE ACQUE DI PIATTAFORMA	LIMITI ALLO SCARICO l/s*ha
CONDOTTO SESSA MAGGIORE	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	NO	-
TUBAZIONE CAVAZZOLI-RONCOCESI	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	NO	-
TORRENTE CROSTOLO	AIPO	principale	SI	Nessun limite allo scarico imposto
FOSSETTA S.GIULIO	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	3.00
FOSSETTA BARATTO	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	3.00
FOSSETTA GIANFERRARI	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	3.00
CAVO GUAZZATORE	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	3.00

TANGENZIALE NORD DI REGGIO EMILIA nel tratto da San Prospero Strinati a Corte Tegge				
NOME RILIEVO	GESTORE	RANGO	POSSIBILITA' DI SCARICARE ACQUE DI PIATTAFORMA	LIMITI ALLO SCARICO l/s*ha
FOSSO 1	privato	minore	NO	solo in caso di assenza di altri recapiti in cui è consentito scaricare si consente un limite allo scarico di 4 l/s*ha. Se occorre, risezionare il fosso esistente dallo scarico fino alla foce
FOSSO 2	privato	minore	NO	solo in caso di assenza di altri recapiti in cui è consentito scaricare si consente un limite allo scarico di 4 l/s*ha. Se occorre, risezionare il fosso esistente dallo scarico fino alla foce
FOSSO 3	privato	minore	NO	solo in caso di assenza di altri recapiti in cui è consentito scaricare si consente un limite allo scarico di 4 l/s*ha. Se occorre, risezionare il fosso esistente dallo scarico fino alla foce
FOSSETTA BALLANLEOCHE	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	NO	-
FOSSETTA VALLE PIEVE MODOLENA	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	8.00
FOSSETTA CASTELLARA	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	8.00
FOSSO 5	privato	minore	NO	solo in caso di assenza di altri recapiti in cui è consentito scaricare si consente un limite allo scarico di 4 l/s*ha. Se occorre, risezionare il fosso esistente dallo scarico fino alla foce
IRRIGATORIO DI VIA FERRARONI	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	minore	NO	-
FOSSETTA VALLE RONCOCESI	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	8.00
TORRENTE MODOLENA	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	principale	SI	20.00
TORRENTE QUARESIMO	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	principale	SI	20.00
FOSSETTA DELLA TORRETTA	CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE	secondario	SI	8.00
FOSSO 4	privato	minore	NO	solo in caso di assenza di altri recapiti in cui è consentito scaricare si consente un limite allo scarico di 4 l/s*ha. Se occorre, risezionare il fosso esistente dallo scarico fino alla foce

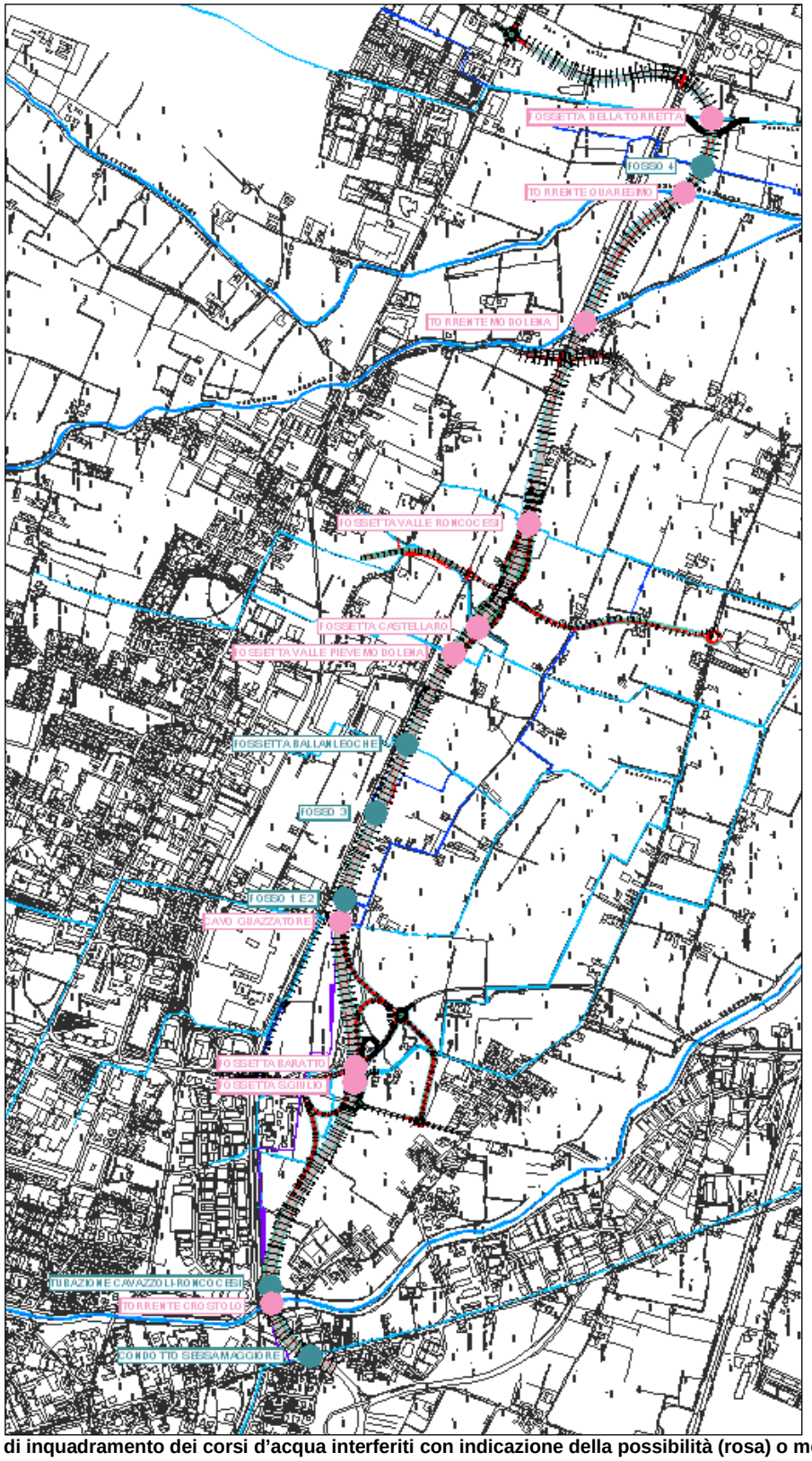


Figura 5-1: Planimetria di inquadramento dei corsi d'acqua interferiti con indicazione della possibilità (rosa) o meno (azzurro) di scaricare le acque di piattaforma

6. ANALISI IDROLOGICHE

Lo studio idrologico, quale azione propedeutica per la calibrazione dei parametri di progetto, ha previsto l'indagine sul regime delle piogge di breve durata e forte intensità per un Tempo di Ritorno di 25-50-100 anni, in tutti i pluviometri situati nelle vicinanze del tratto autostradale, finalizzata alla definizione delle curve di possibilità pluviometrica e dei relativi ietogrammi di progetto. Lo studio è stato suddiviso in due parti, ciascuna influenzata dalla durata di pioggia:

1) Verifica dei manufatti di raccolta e smaltimento sollecitati da eventi di pioggia di durata >1 ora per TR=50 anni: rientrano tra questi i sistemi di raccolta tramite fosso di guardia che come già anticipato svolge anche la funzione laminativa;
2) Verifica dei manufatti di raccolta e smaltimento sollecitati da eventi di pioggia di durata <1 ora per TR=25 e 100 anni: rientrano tra questi manufatti quelli legati a viadotti, ponti, tratti in curva e in trincea, ovvero quelli che necessariamente debbono scaricare prima possibile le acque defluite.

6.1. INDAGINI PLUVIOMETRICHE

L'area presa a riferimento, caratterizzata da omogeneità idrologica, è quella compesa tra le province di Reggio Emilia e Parma, si tratta di un'area estesa ma che presenta omogeneità climatica, essendo tutta appartenente alla Pianura Padana a sud del Po e limitata a sud dalla catena appenninica che la separa dai regimi tirrenici.

Nell'ambito dello studio sono state prese in esame le stazioni pluviometriche ufficiali all'interno dell'area afferente al progetto, successivamente sono state scelte le stazioni più vicine geograficamente all'area e soprattutto dotate di un numero considerevole di dati.

Tabella 6-1: Stazioni pluviometriche ufficiali ricadenti all'interno dell'area di studio

CODICE	STAZIONE	COMUNE	PROV_	STRUMENTO	QUOTA (m slm)	ANNI DI ATTIVITA'
SP_01	POVIGLIO	Poviglio	(RE)	RP: stazione dotata di radiotrasmettitore	29,00	1963-2008
SP_02	REGGIO EMILIA	Reggio Emilia	(RE)	RP: stazione dotata di radiotrasmettitore	51,00	1951-2011
SP_03	QUATTRO CASTELLA	Quattro Castella	(RE)	RP: stazione dotata di radiotrasmettitore	173,00	2003-2011
SP_04	BASILICAGOIANO	Montechiarugolo	(PR)	RP: stazione dotata di radiotrasmettitore	113,00	1966-2007
SP_05	NOVELLARA SIRONA	Novellara	(RE)	P: Pluviometro registratore	19,00	1936-2005
SP_06	VILLA MASONE	Reggio Emilia	(RE)	P: Pluviometro registratore	56,00	1924-2005
SP_07	VEDRIANO	Canossa	(RE)	P: Pluviometro registratore	590,00	1913-2001

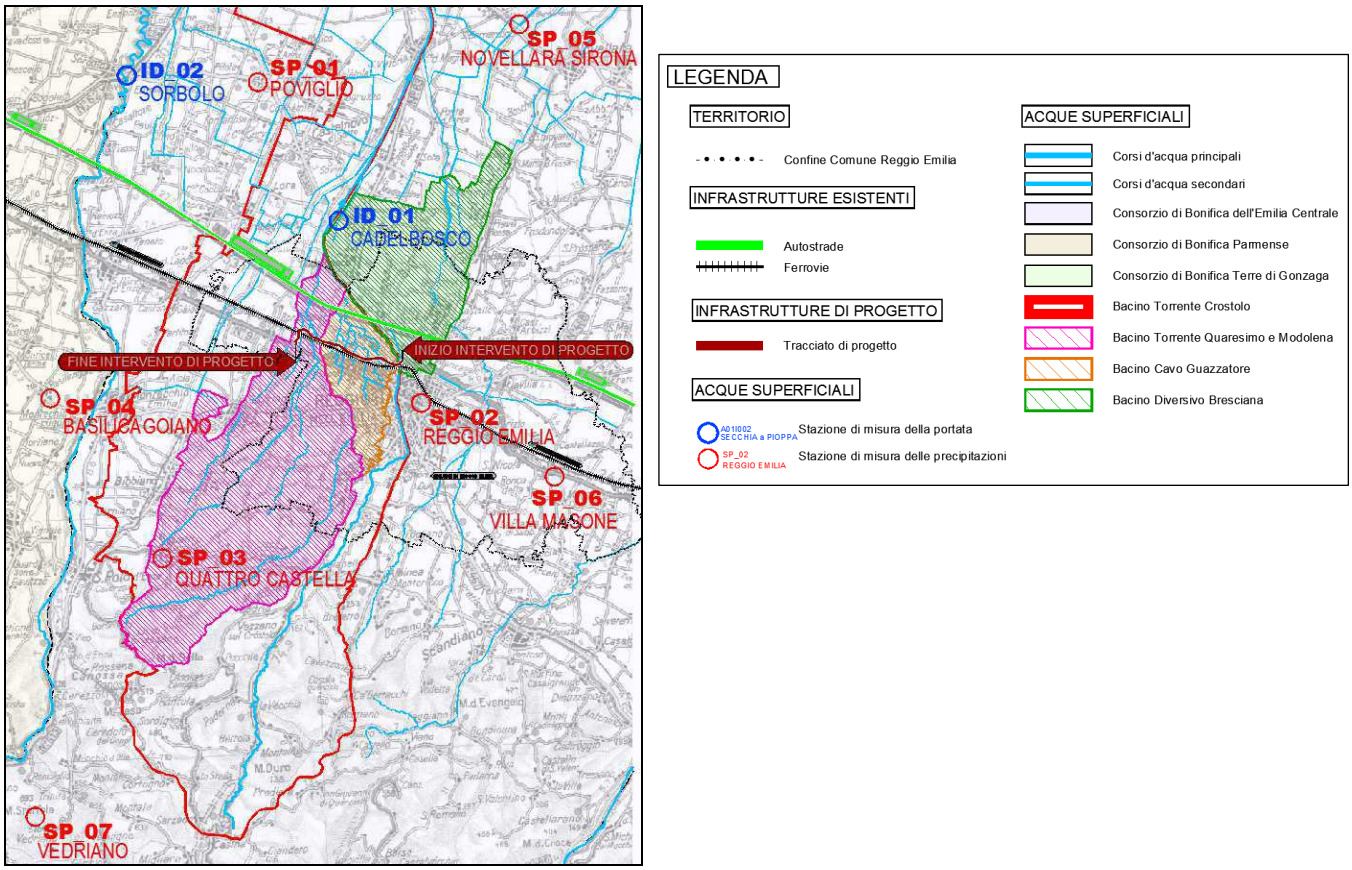


Figura 6-1: Planimetria delle stazioni pluviometriche ufficiali ricadenti all'interno dell'area di studio

Le stazioni scelte sono le stazioni di Poviglio, Reggio Emilia e Quattro Castella, ricadenti all'interno dell'intera area afferente al progetto della tangenziale. Per tali stazioni sono stati rilevati i valori di pioggia caratteristici e sono state determinate le curve di possibilità pluviometriche nell'intorno dell'area interessata dalla nuova strada, con ragguaglio all'area attraverso il metodo dei topoieti e quindi con discretizzazione su 2 tratti, quello est e quello ovest.

Tabella 6-2: Misure relative alle precipitazioni di massima intensità registrate al pluviografo di Poviglio (1963-2008)

Anno	INTERVALLO IN ORE					INTERVALLO IN MIN.		
	1	3	6	12	24	15'	30'	45'
	mm	mm	mm	mm	mm	mm	mm	mm
1963	34.8	42.4	47.8	61.8	69.6			
1964	24.2	34.2	49.8	70.6	79.6			
1965	35.8	45.8	46.6	51	69.8			
1966	31	45.4	45.6	59.4	64.6			
1967	50.6	63.4	76.8	77.2	77.2			
1968	15.2	21.8	33.2	50.8	58.2			
1969	19	31	35.4	38.8	42.4			
1970	32.2	38.2	38.4	38.4	38.4			
1971	13	13.2	25.4	47.6	57.6			
1972	29.6	40	42.6	52.8	55.2			
1973	27.6	33.4	48.6	57.8	68.6			

	INTERVALLO IN ORE						INTERVALLO IN MIN.		
Anno	1	3	6	12	24		15'	30'	45'
	mm	mm	mm	mm	mm		mm	mm	mm
1974	14.6	21.2	33.8	47.8	58.4				
1975	21.2	32.4	37.8	42.6	60.4				
1976	41.2	41.2	41.2	41.2	48				
1977	40.8	40.8	53.4	59.2	83.8				
1978	40.4	40.4	40.4	46.4	67.4				
1979	17.6	22	31	47	55.4				
1980	22.2	28.4	29	35.4	50.6				
1981	34	47	59.8	60.2	60.2				
1982									
1983	11.6	13.4	13.4	15.2	44.4				
1984	90	95.6	95.8	95.8	95.8				
1985	10.4	14.2	14.2	24.6	32.6				
1986	21	23.4	27.8	31.4	40.6				
1987							11.6	17.6	22.8
1988							17.4	19.6	21.8
1989							13.4	19.6	21.8
1990									
1991									
1992									
1993									
1994									
1995	22.4	33	33	33	51.6		11.6	16	20.4
1996									
1997	23.6	26	31.8	34.6	42.8		13.6	18.8	22.4
1998	13.8	23.6	24.4	28	46.4		8.4	10.4	12
1999	20.4	25.6	37.8	44.8	55.4		10.2	12.8	20
2000	11.2	24.8	34.8	37.2	40.2		10	10	10
2001	15.4	23.8	28.4	42.2	43.6		6.6	10	15.4
2002	5.2	12	20	30	37.6		1.4	2.6	4
2003									
2004	11.8	20.2	36.6	47.2	51		7.2	10.4	11.2
2005	26.6	26.8	29.2	41.4	48.4		25.5	25.5	25.8
2006	27.4	27.4	27.4	27.6	34.4		14.6	22.8	26.8
2007	17.6	17.8	17.8	18.4	28.2		11	15.4	16.6
2008	48.4	53.4	54.6	70.6	72		24.2	43.6	47
2009									
2010									
2011									

Tabella 6-3: Misure relative alle precipitazioni di massima intensità registrate al pluviografo di Reggio Emilia (1951-2011)

	INTERVALLO IN ORE						INTERVALLO IN MIN.		
Anno	1	3	6	12	24		15'	30'	45'
	mm	mm	mm	mm	mm		mm	mm	mm
1951	28.5	35.3	35.5	41	61				
1952	16.4	17	21.5	40	66.5				
1953	21	29	39	54	72.4				
1954	19.5	21.2	35.8	41	62				

Anno	INTERVALLO IN ORE					INTERVALLO IN MIN.		
	1	3	6	12	24	15'	30'	45'
	mm	mm	mm	mm	mm	mm	mm	mm
1955	39	54.4	54.7	54.7	56.2			
1956	23	25.2	39	48	73			
1957	28	37.6	37.8	41	70.4			
1958	24.2	30.6	39	65	91			
1959	19.8	30.2	40	57	74			
1960	38	60	77	78	78			
1961								
1962	22	26.4	33	49	66			
1963	38	38.4	38.4	38.4	41			
1964	18.4	31	50.2	61.4	64.2			
1965	10.2	15	19.2	25	27.6			
1966	23.6	27.8	29.8	33	68.2			
1967	21	21.8	34	47.6	60			
1968	10	14	23	37.4	48.8			
1969	25	27.6	27.8	36.2	41.4			
1970	12.6	18	23	27.8	30.6			
1971	18.2	18.4	21.6	25.4	43.4			
1972	48.4	54.8	54.8	54.8	80.8			
1973	24	43	48.4	79.8	92.6			
1974	30.4	30.4	30.4	30.4	36.2			
1975	26	29.6	29.6	36	61			
1976	39.2	40.2	40.2	40.2	41.6			
1977	72.4	74.6	74.6	74.6	97.4			
1978	25.8	34.4	35.8	49.4	49.6			
1979	26.4	64.2	88.8	123.4	194.6			
1980	17	24.2	29	36.8	46.8			
1981	31.6	36.2	50	54.4	77.4			
1982	23	27.6	28	35.6	46.2			
1983	43	43.4	43.4	43.4	47			
1984	20	28.2	36.4	45.2	55.4			
1985	27.2	29.4	29.6	29.6	32.4			
1986	26.8	26.8	41.2	51.4	59.8			
1987								
1988	7.8	11.8	18.6	25.8	25.8			
1989	20.8	22.6	25.4	40.4	55.6			
1990	46.2	54.2	66.8	95.6	102.4	31.8	40.4	43.4
1991	23.4	23.4	27	50.8	74.6	19.2	22.2	23.4
1992	56.6	56.6	56.6	56.6	96.6	49.8	54.2	56.6
1993	41.8	41.8	41.8	41.8	58.4	20.6	40	41.6
1994	25	35.6	45	50.2	72.8	14.4	22	23.6
1995								
1996	17.6	19	27.8	38	65.6	11	13.6	16.2
1997	20.6	28.4	30.8	33.6	34.6	7.2	11.4	17.8
1998	11.2	14.6	23.2	31.4	32.2	5	8.2	10.6
1999	19.8	33.8	50.2	87.8	131.6	10.6	12.2	17.2
2000	18.8	27.6	42.4	49.4	52.8	10	13	14.4
2001	19	30.2	36.6	36.6	39.8	10	13.6	17.2
2002	28.2	38.4	51.8	51.8	52	12.8	20	22.4
2003								

	INTERVALLO IN ORE					INTERVALLO IN MIN.		
Anno	1	3	6	12	24	15'	30'	45'
	mm	mm	mm	mm	mm	mm	mm	mm
2004	22.4	36.8	47	69.4	74.8	12.8	20.4	22
2005								
2006								
2007	18.8	24.2	32.8	38.6	65.8	12	17.2	17.8
2008	54	70.6	70.6	70.8	70.8	17.2	31.4	45.4
2009	34.8	35.8	35.8	35.8	40	20	29.6	34
2010	18.4	30	38.4	48.8	58	7.8	11.4	14.2
2011	25.2	30.6	32.6	44.4	56.2	12.8	22.2	23

Tabella 6-4: Misure relative alle precipitazioni di massima intensità registrate al pluviografo di Quattro Castella (2003-2011)

	INTERVALLO IN ORE					INTERVALLO IN MIN.		
Anno	1	3	6	12	24	15'	30'	45'
	mm	mm	mm	mm	mm	mm	mm	mm
2003	12.6	18.8	31.2	50	70.8	12.6	12.6	12.6
2004	28.2	47.8	57.6	70.4	77.8	10.8	16.6	23.2
2005	39.8	48	48.2	74.2	81.4	15.8	30.4	37.6
2006	33.4	36.8	37.4	42	51.4	16.2	28	31.8
2007	30.2	59.6	60.2	60.4	79.4	12	21	26.6
2008	29.4	34.8	35.4	53.8	85.4	12.2	20.8	26.6
2009	24.4	47	49	52.6	59.2	12.8	19.8	23.2
2010	13.6	23.2	27.2	42.6	56.4	7.2	10.2	12.4
2011	28.4	29.6	33	45.2	58.8	21.8	27.4	27.6

6.2. METODOLOGIA DI RICOSTRUZIONE DELLE CURVE DI POSSIBILITA' PLUVIOMETRICA PER INTENSITA' DI PIOGGIA DA 1, 1.5, 2, 2.5, 3, 6, 12 E 24 ORE

Per la determinazione della relazione fra altezza (h) e durata (t) dell'evento di pioggia in funzione del tempo di ritorno (TR), si fa riferimento alla legge probabilistica che meglio si adatta al campione di dati utilizzato.

Nel caso delle 3 stazioni pluviometriche in esame, la determinazione della relazione fra altezza (h) e durata (t) dell'evento di pioggia in funzione del Tempo di Ritorno (TR) è stata ottenuta tramite la legge probabilistica di Gumbel, stimandone i parametri a(T) ed n(T), al fine di ottenere la curva di possibilità pluviometrica nella forma:

$$h = a(T)t^{n(T)}$$

L'elaborazione statistica ha portato alla definizione delle curve di possibilità climatica, dove l'altezza di pioggia espressa in millimetri è rappresentata dall'espressione:

$$h = n - \frac{\ln\cdot\left(-\ln\cdot\left(1-\frac{1}{T_R}\right)\right)}{a}$$

dove:

TR = tempo di ritorno

$$n = Y - \overline{Y}_N \cdot S_Y / S_N$$

$$a = S_N / S_Y$$

Y_N = media ridotta

S_N = deviazione standard ridotta

Y = media aritmetica delle massime altezze di pioggia osservate

Sy = scarto quadratico medio delle massime altezze di pioggia osservate.

Per stimare la CPP rappresentativa dei due tratti est e ovest della tangenziale si è proceduto associando alle tre stazioni prese in esame un peso, calcolato con il metodo dei poligoni di Thiessen o Topoieti, e ricavando le intensità di pioggia per assegnato TR all'interno del singolo tratto.

Il metodo di Thiessen assume che in qualsiasi punto del bacino la pioggia caduta sia la stessa del pluviometro più vicino; in questo modo si suppone che la misura di ogni strumento possa essere

rappresentativa di un'area che si estende radialmente dallo strumento fino alla semidistanza dallo strumento adiacente, in ogni direzione. Procedendo in questo modo si ricavano le curve di possibilità pluviometrica all'interno di ogni singolo tratto.

Si riportano di seguito, per i diversi tempi di ritorno analizzati, le tabelle riassuntive dei valori di h in millimetri per durate di 1, 1.5, 2, 2.5, 3, 6, 12 e 24 ore e le CPP per singolo tratto.

Tabella 6-5: Altezze di pioggia tratto Ovest – Stazioni pluvio. Poviglio, Reggio Emilia e Quattro Castella

durata	ALTEZZA DI PIOGGIA [mm]						
[ore]	Tr=1000	Tr=500	Tr=200	Tr=100	Tr=50	Tr=25	Tr=20
1	100.58	92.38	81.54	73.33	65.10	56.82	54.13
1.5	106.35	97.85	86.61	78.09	69.55	60.94	58.15
2	110.71	101.99	90.45	81.70	72.92	64.07	61.20
2.5	114.26	105.36	93.57	84.63	75.66	66.62	63.68
3	117.28	108.22	96.23	87.13	78.00	68.79	65.80
6	129.77	120.06	107.21	97.47	87.68	77.81	74.60
12	144.08	133.63	119.81	109.32	98.79	88.18	84.74
24	160.51	149.22	134.27	122.94	111.58	100.14	96.43

Tabella 6-6: Altezze di pioggia tratto Est – Stazioni pluvio. Poviglio, Reggio Emilia e Quattro Castella

durata	ALTEZZA DI PIOGGIA [mm]						
[ore]	Tr=1000	Tr=500	Tr=200	Tr=100	Tr=50	Tr=25	Tr=20
1	96.45	88.71	78.47	70.72	62.94	55.11	52.57
1.5	103.05	94.92	84.16	76.01	67.82	59.58	56.91
2	108.08	99.65	88.50	80.04	71.55	63.00	60.23
2.5	112.20	103.53	92.05	83.35	74.61	65.80	62.95
3	115.71	106.83	95.08	86.17	77.22	68.20	65.27
6	130.38	120.63	107.73	97.94	88.11	78.21	74.99
12	147.39	136.64	122.41	111.62	100.78	89.86	86.32
24	167.17	155.25	139.48	127.53	115.53	103.46	99.54

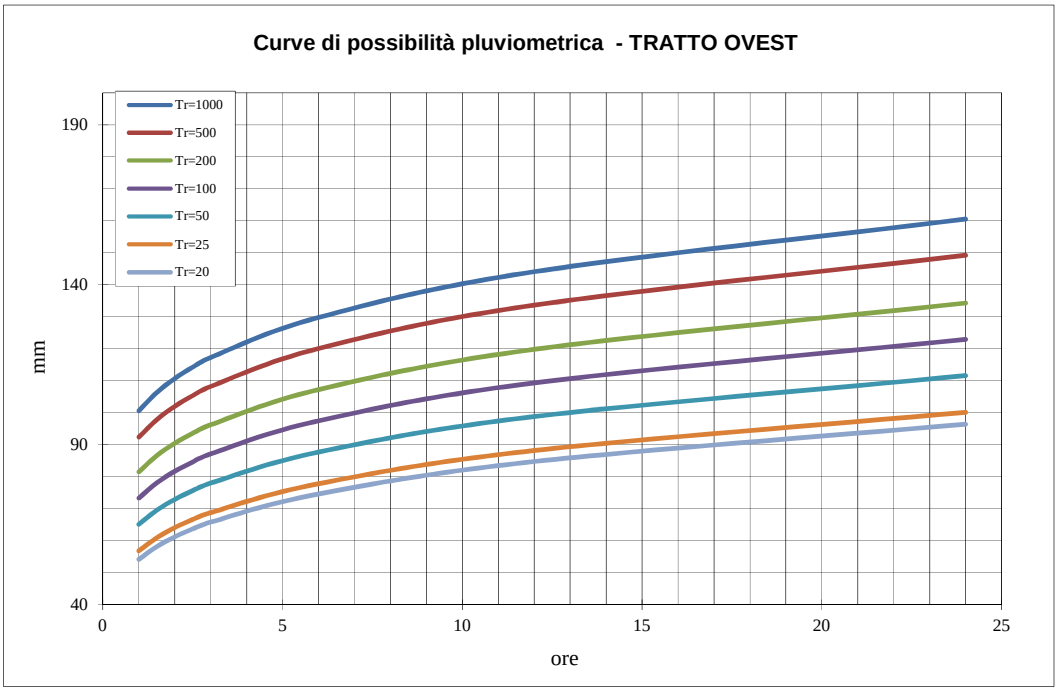


Figura 6-2: Linee segnalatrici di possibilita' pluviometrica – Tratto Ovest

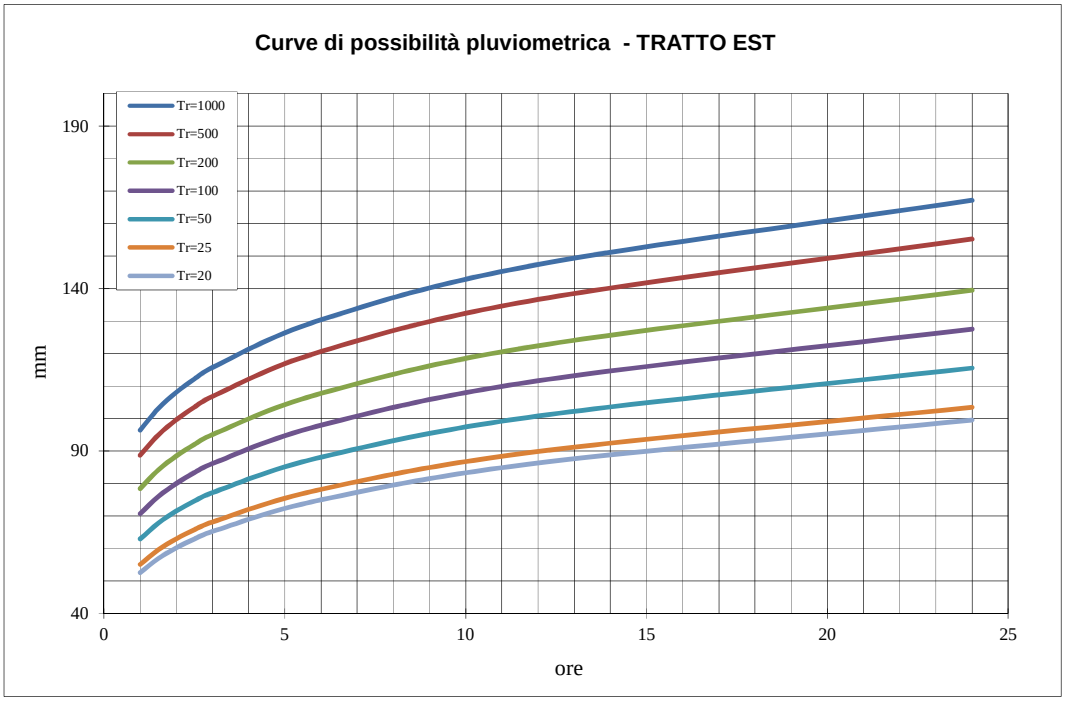


Figura 6-3: Linee segnalatrici di possibilita' pluviometrica – Tratto Est

6.3. METODOLOGIA DI RICOSTRUZIONE DELLE CURVE DI POSSIBILITA' PLUVIOMETRICA PER INTENSITA' DI PIOGGIA INFERIORI A 1 ORA

Per la verifica dei sistemi di raccolta nei tratti di maggior criticità, ovvero i ponti, i viadotti, i tratti in curva e in trincea, cioè quelli in cui la risposta al deflusso è immediata, si deve necessariamente calcolare la sollecitazione più gravosa durante eventi di pioggia intensi e di durata inferiore ad 1 ora.

Si sono pertanto ricostruite, sempre con l'utilizzo del metodo dei Topoieti esposto precedentemente, le CPP per singolo tratto. Tra questi si è scelto quello più gravoso per il dimensionamento e la verifica dei manufatti di raccolta e scolo.

Si riportano di seguito, per i diversi tempi di ritorno analizzati, le tabelle riassuntive dei valori di h in millimetri per durate di 0.25, 0.5 e 0.75 ore e le CPP per singolo tratto sotteso.

Tabella 6-7: Altezze di pioggia tratto Ovest – Stazioni pluvio. Poviglio, Reggio Emilia e Quattro Castella

durata	**ALTEZZA DI PIOGGIA [mm]**						
[ore]	Tr=1000	Tr=500	Tr=200	Tr=100	Tr=50	Tr=25	Tr=20
0.25	60.45	55.41	48.73	43.67	38.59	33.47	31.81
0.5	76.95	70.66	62.34	56.03	49.70	43.32	41.25
0.75	88.81	81.63	72.14	64.94	57.71	50.44	48.07

Tabella 6-8: Altezze di pioggia tratto Est – Stazioni pluvio. Poviglio, Reggio Emilia e Quattro Castella

durata	**ALTEZZA DI PIOGGIA [mm]**						
[ore]	Tr=1000	Tr=500	Tr=200	Tr=100	Tr=50	Tr=25	Tr=20
0.25	64.44	59.01	51.84	46.40	40.94	35.44	33.66
0.5	80.54	73.94	65.21	58.59	51.95	45.25	43.08
0.75	91.97	84.55	74.72	67.28	59.81	52.28	49.84

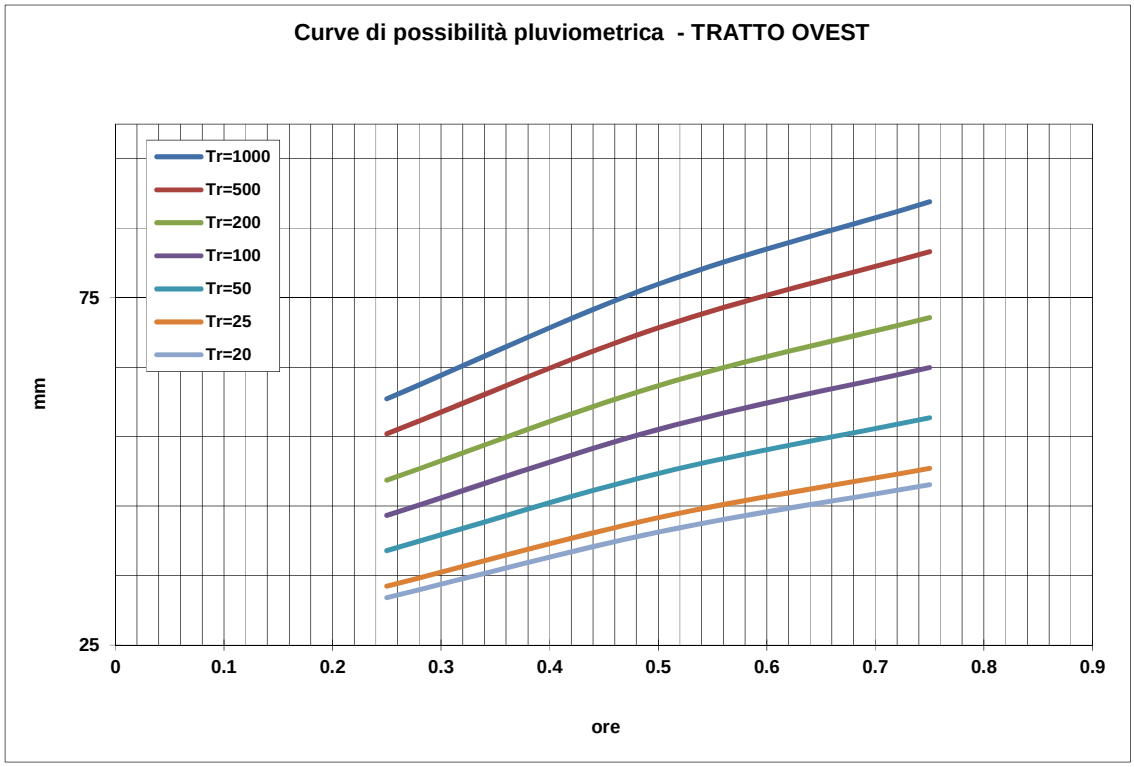


Figura 6-4: Linee segnalatrici di possibilità pluviometrica **– Tratto Ovest**

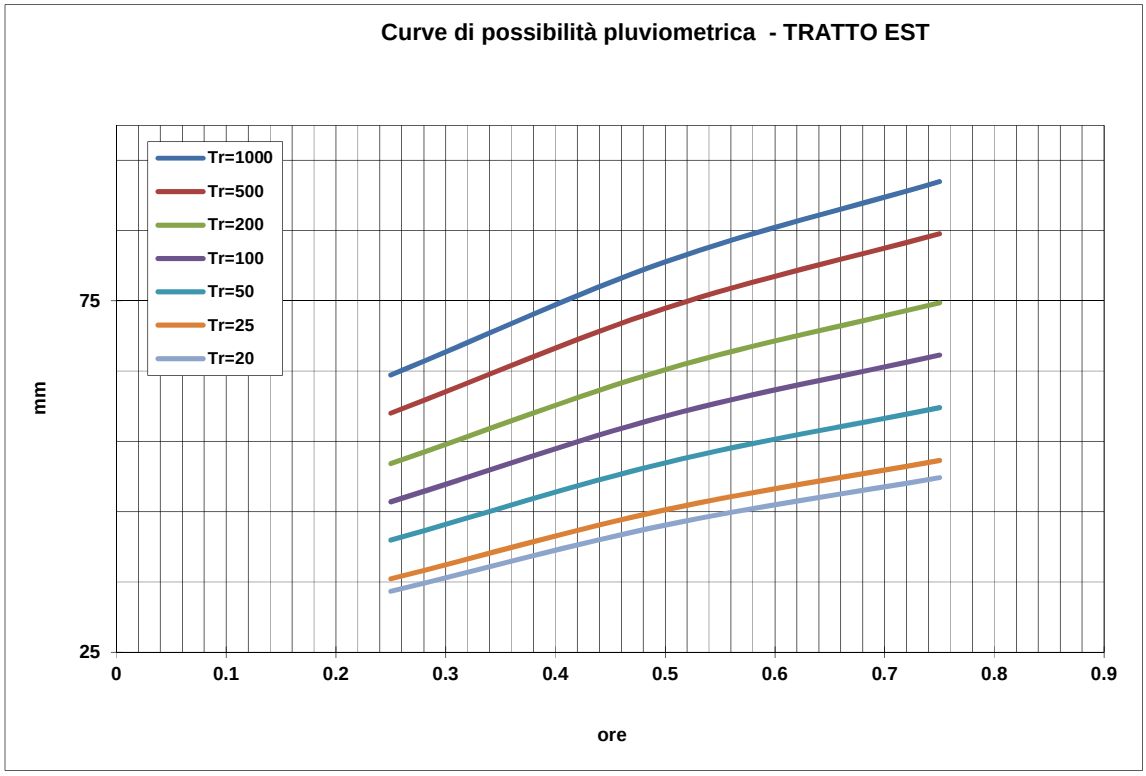


Figura 6-5: Linee segnalatrici di possibilità pluviometrica **– Tratto Est**

6.4. DEFINIZIONE DEGLI IETOGRAMMI DI PROGETTO

Gli ietogrammi di progetto adottati sono di tipo triangolare, ipotizzando che l'andamento temporale dell'intensità di pioggia presenti un picco a metà della durata dell'evento, per tutte le durate di pioggia analizzate, per TR50 e TR100 anni. Per la pioggia di durata pari a 15' e TR25 anni, utilizzata al fine di verificare le prescrizioni impartite da ANAS all'interno del Capitolato, lo ietogramma impiegato è di tipo rettangolare.

Si riportano di seguito gli ietogrammi di progetto adottati.

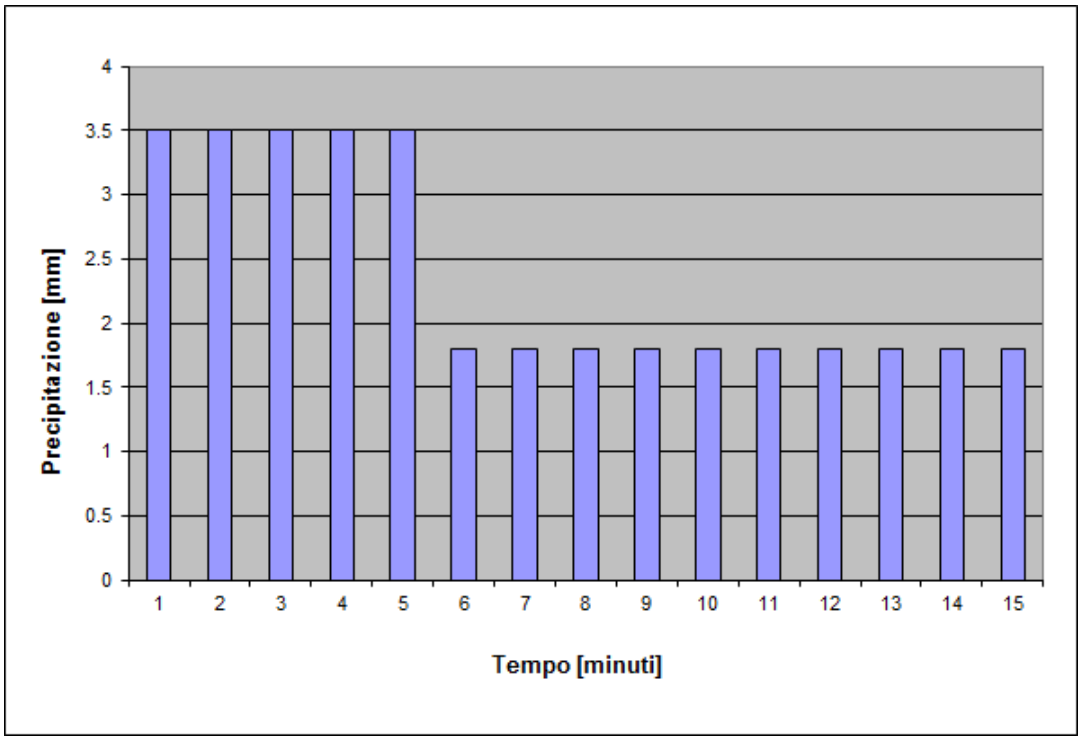


FIGURA 6-6: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 35.5MM E DURATA PARI A 15' – TR25 ANNI

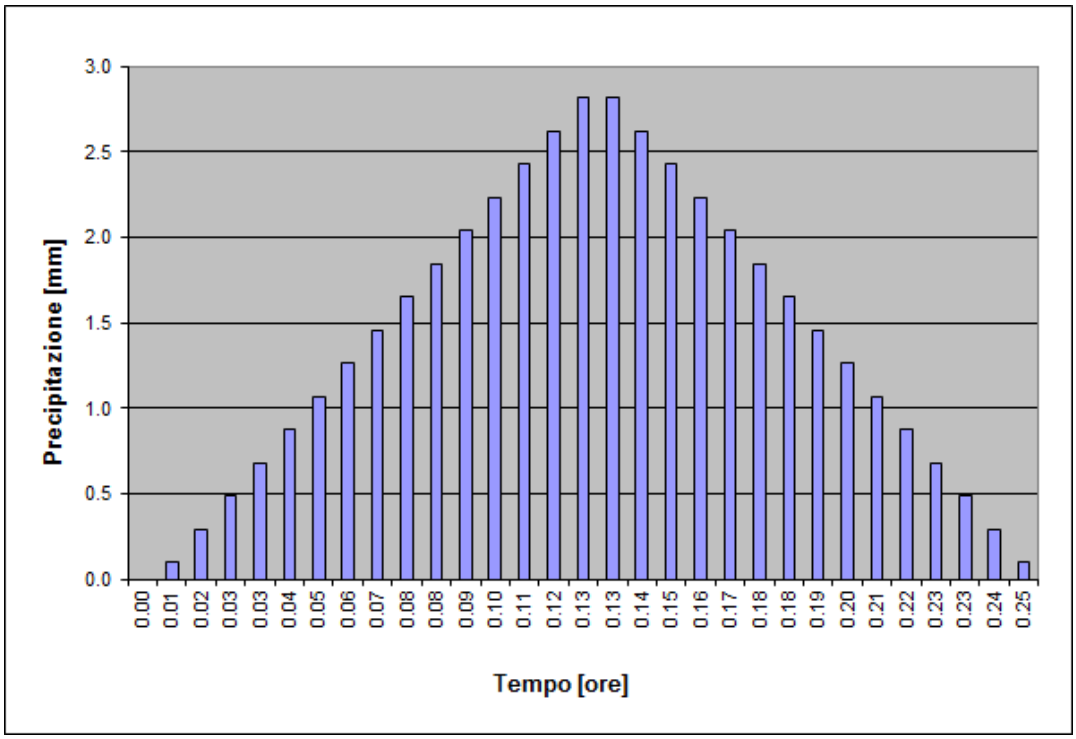


FIGURA 6-7: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 43.67MM E DURATA PARI A 15' – TR100 ANNI

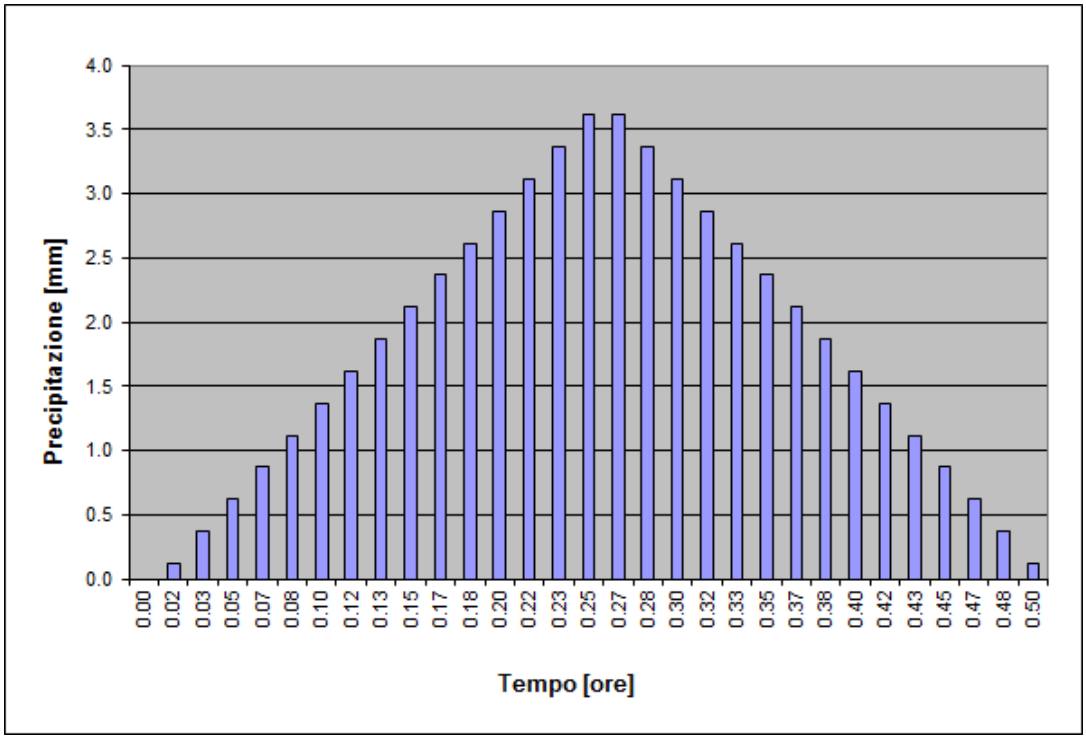


FIGURA 6-8: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 56.03MM E DURATA PARI A 30' – TR100 ANNI

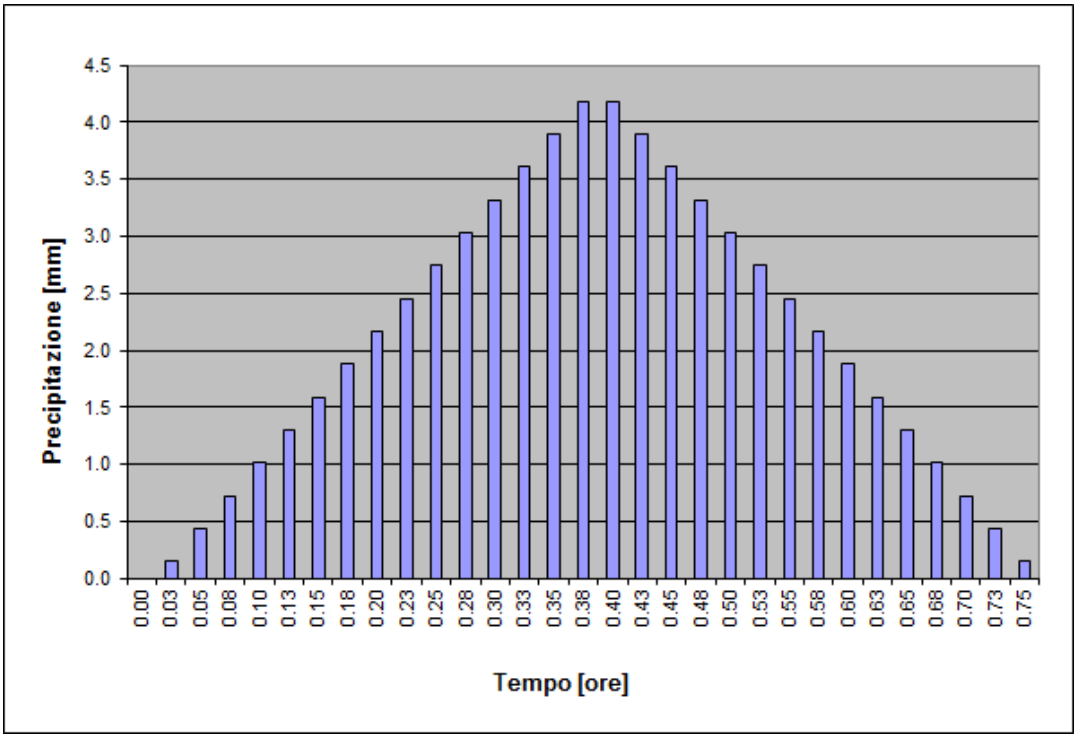


FIGURA 6-9: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 64.94MM E DURATA PARI A 45' – TR100 ANNI

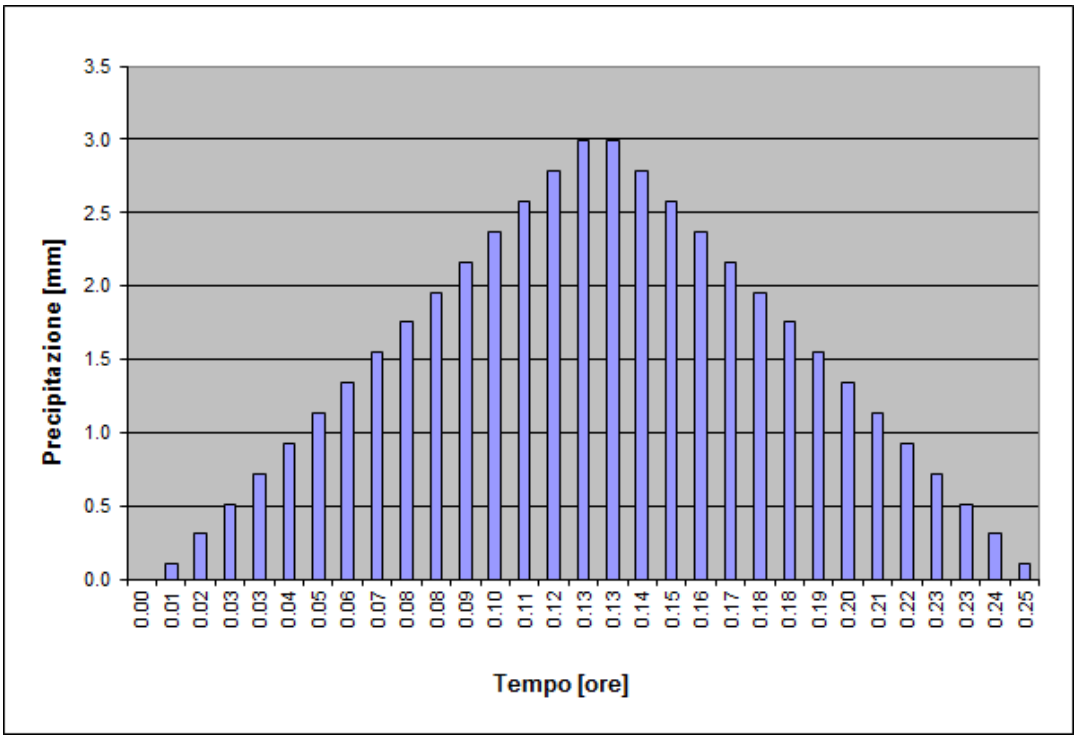


FIGURA 6-10: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 46.4MM E DURATA PARI A 15' – TR100 ANNI

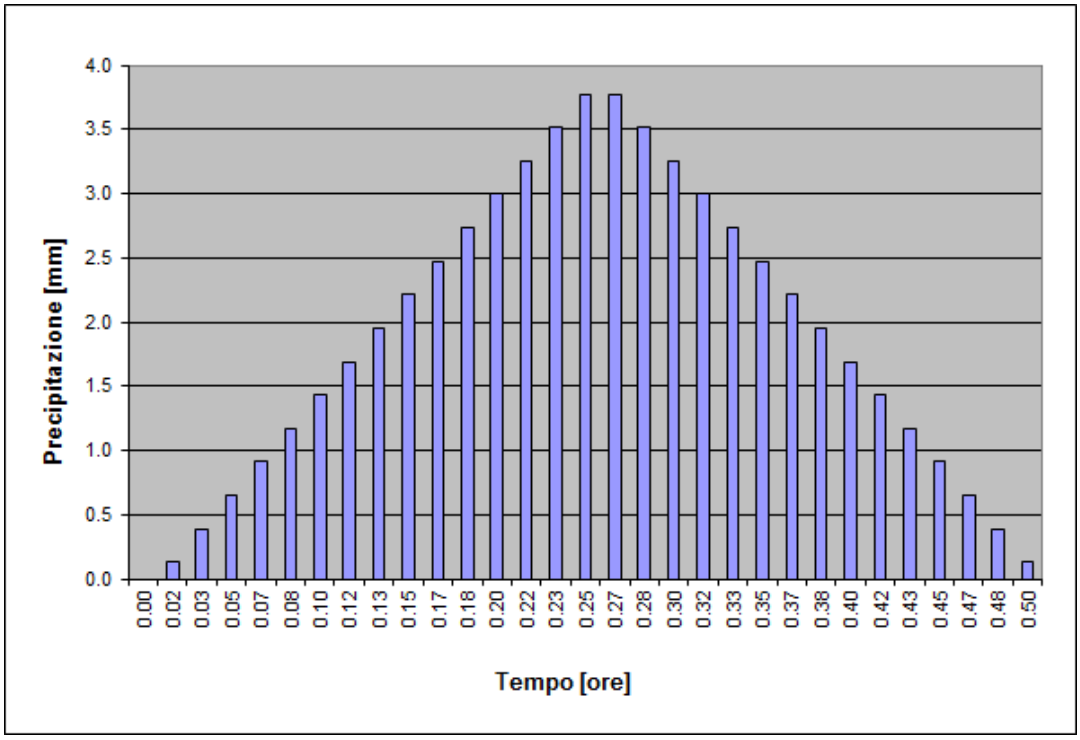


FIGURA 6-11: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 58.59MM E DURATA PARI A 30' – TR100 ANNI

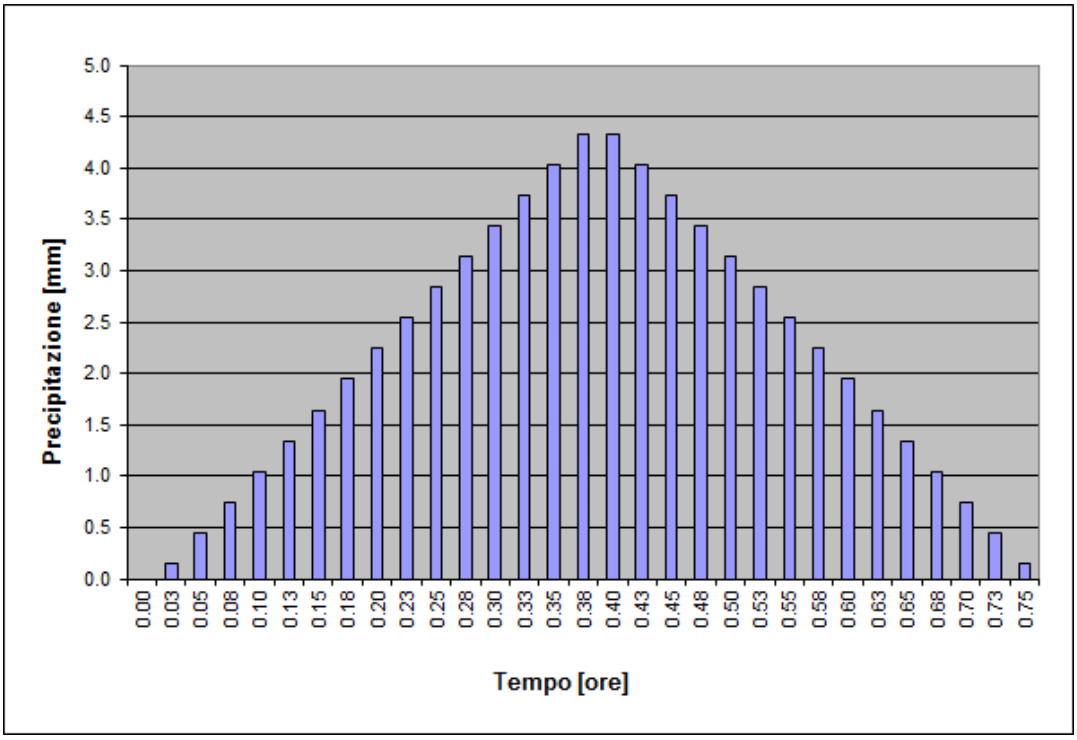


FIGURA 6-12: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 67.28MM E DURATA PARI A 45' – TR100 ANNI

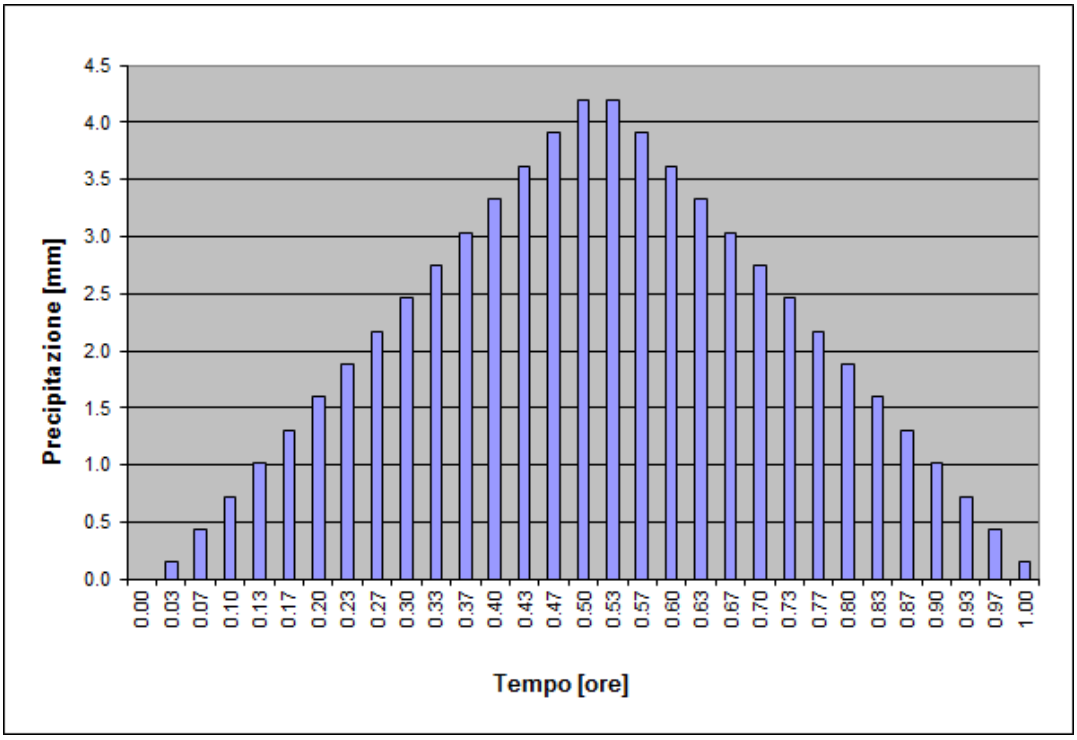


FIGURA 6-13: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 65.10MM E DURATA PARI A 1H – TR50 ANNI

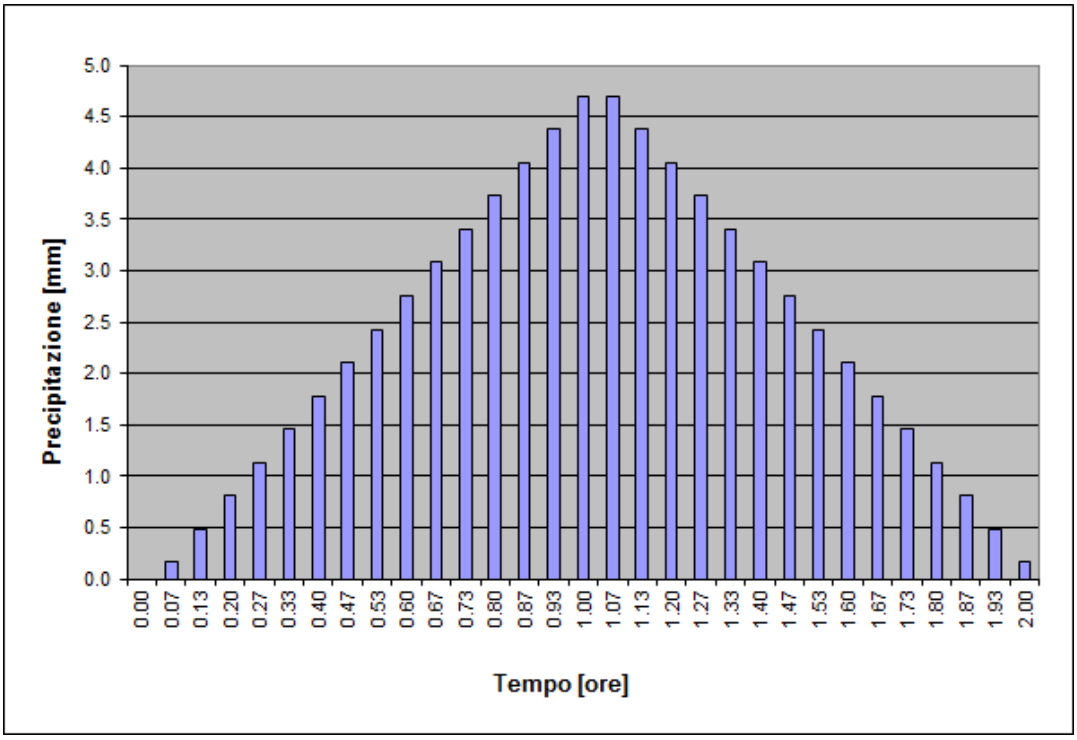


FIGURA 6-14: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 72.92MM E DURATA PARI A 2H – TR50 ANNI

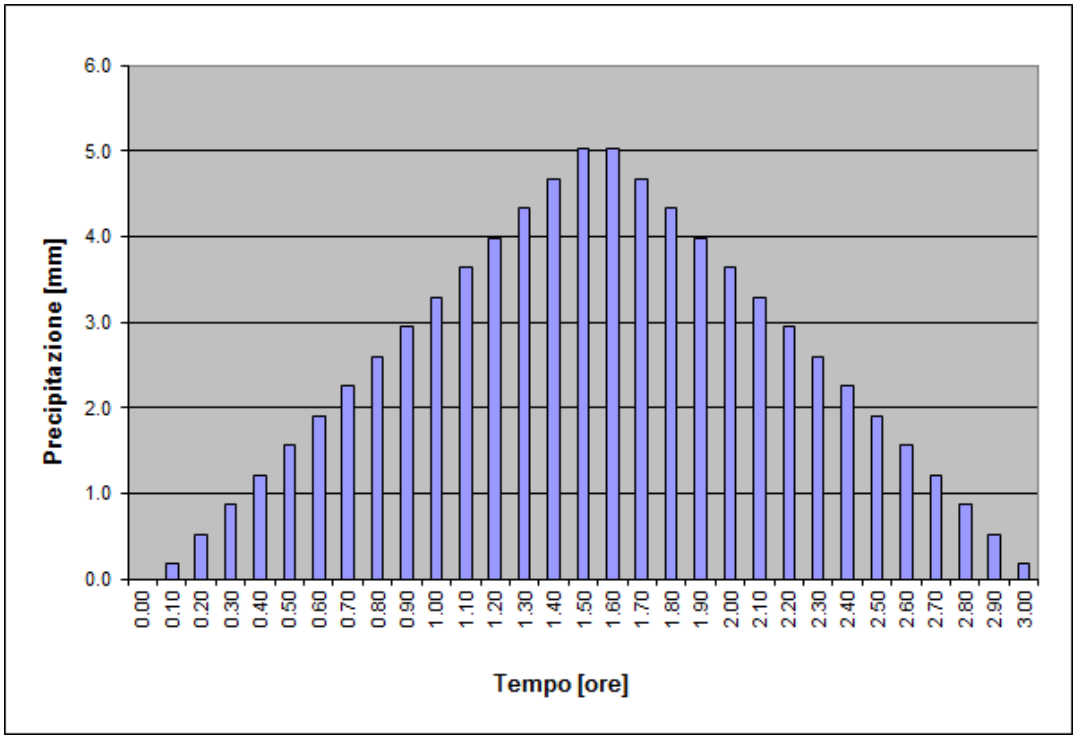


FIGURA 6-15: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 78.00MM E DURATA PARI A 3H – TR50 ANNI

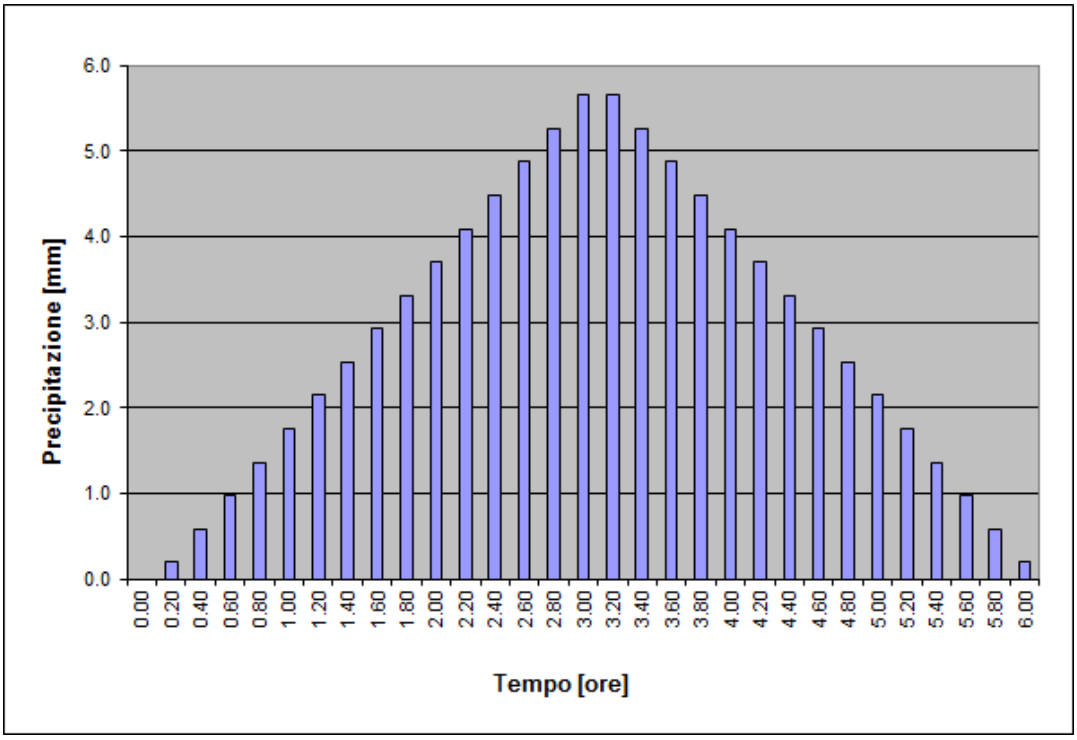


FIGURA 6-16: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 87.68MM E DURATA PARI A 6H – TR50 ANNI

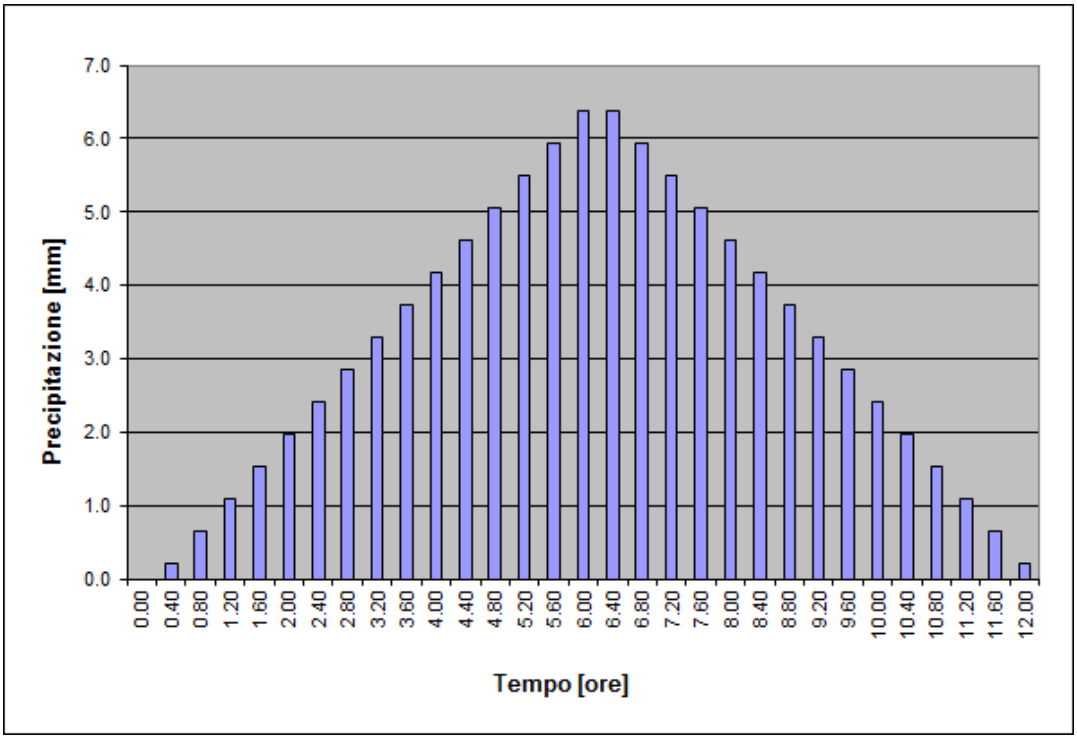


FIGURA 6-17: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 98.79MM E DURATA PARI A 12H – TR50 ANNI

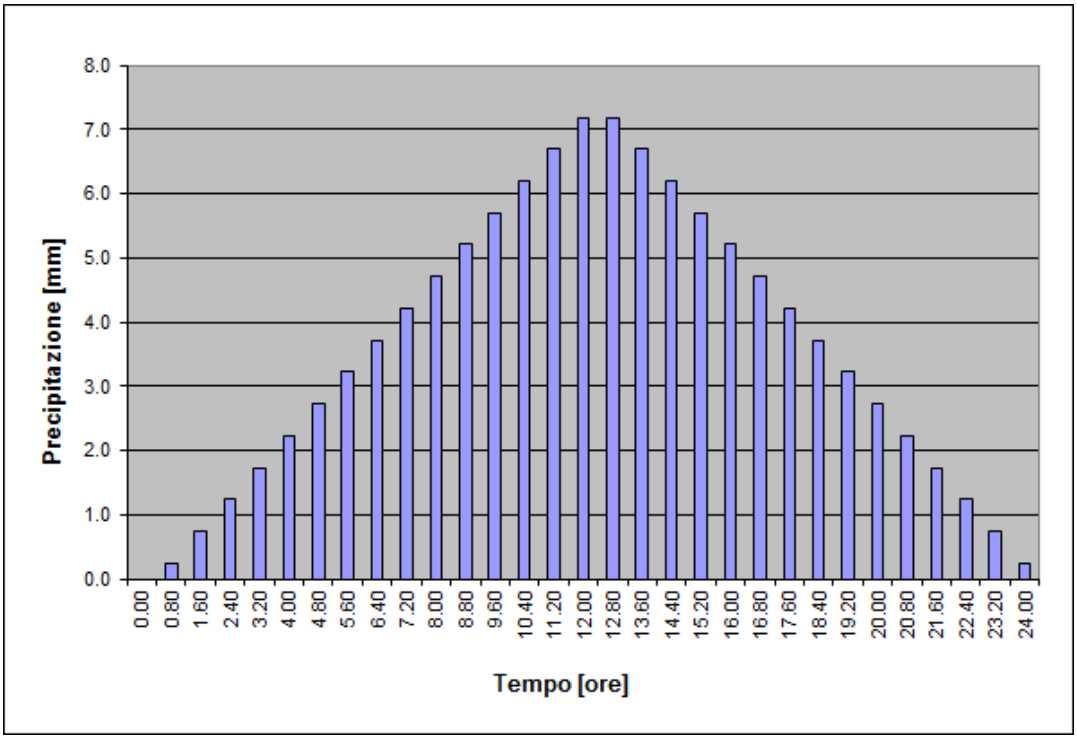


FIGURA 6-18: IETOGRAMMA DI PROGETTO – TRATTO OVEST: ALTEZZA DI PIOGGIA 111.58MM E DURATA PARI A 24H – TR50 ANNI

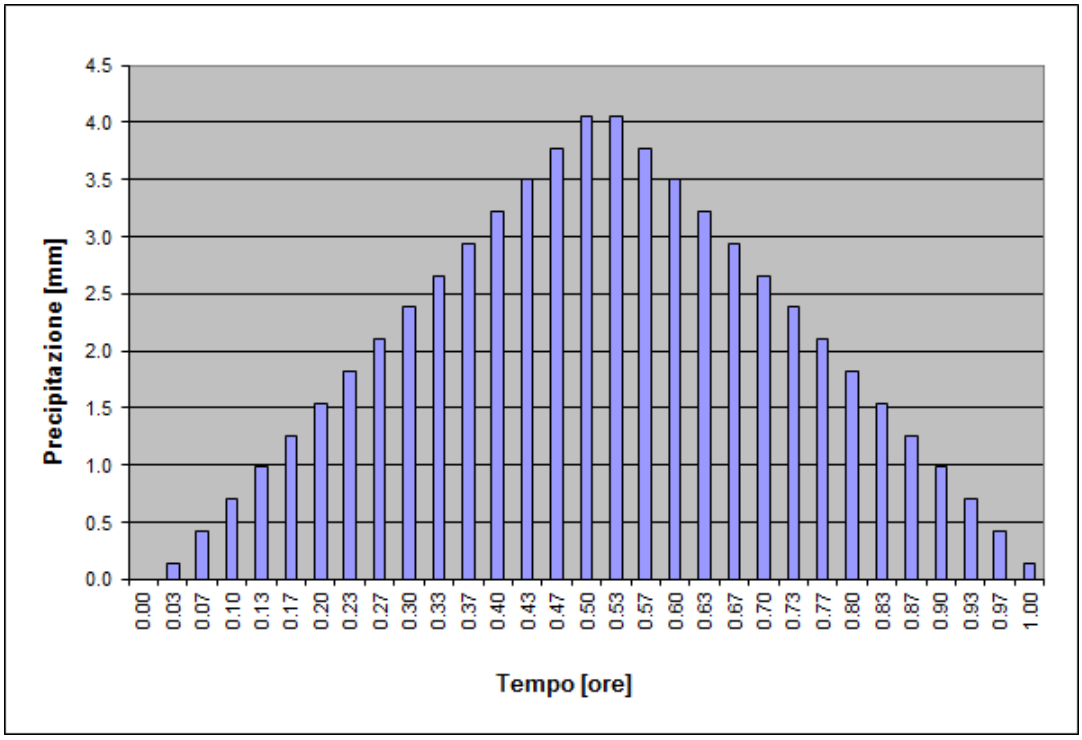


FIGURA 6-19: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 62.94MM E DURATA PARI A 1H – TR50 ANNI

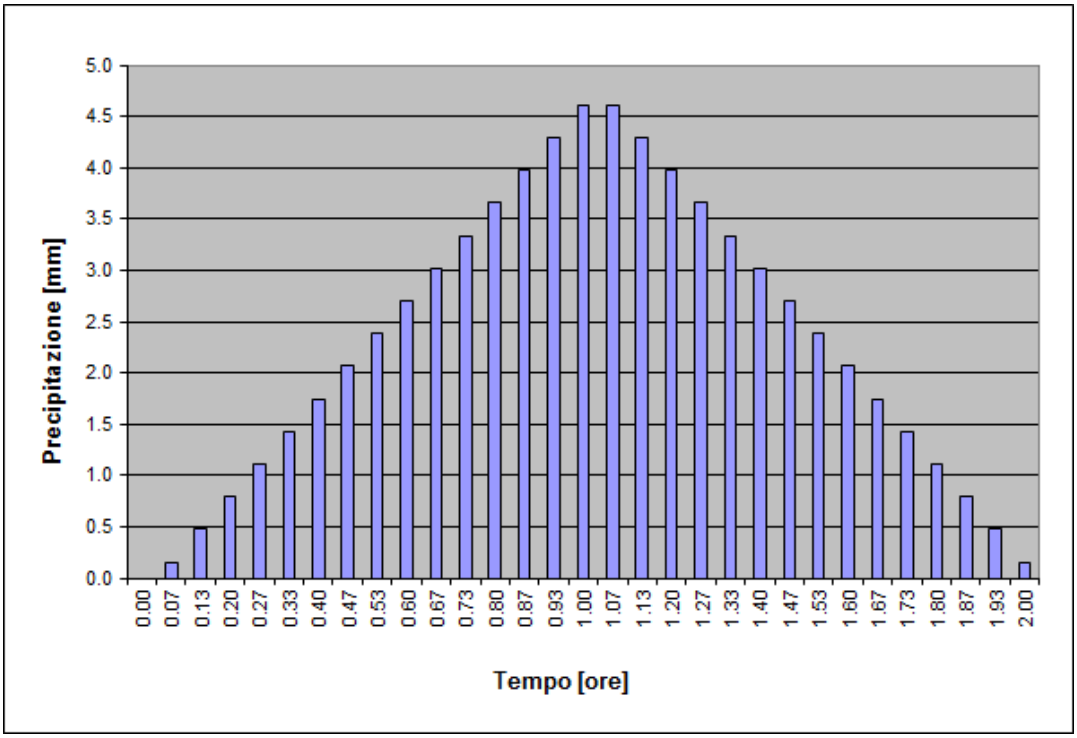


FIGURA 6-20: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 71.55MM E DURATA PARI A 2H – TR50 ANNI

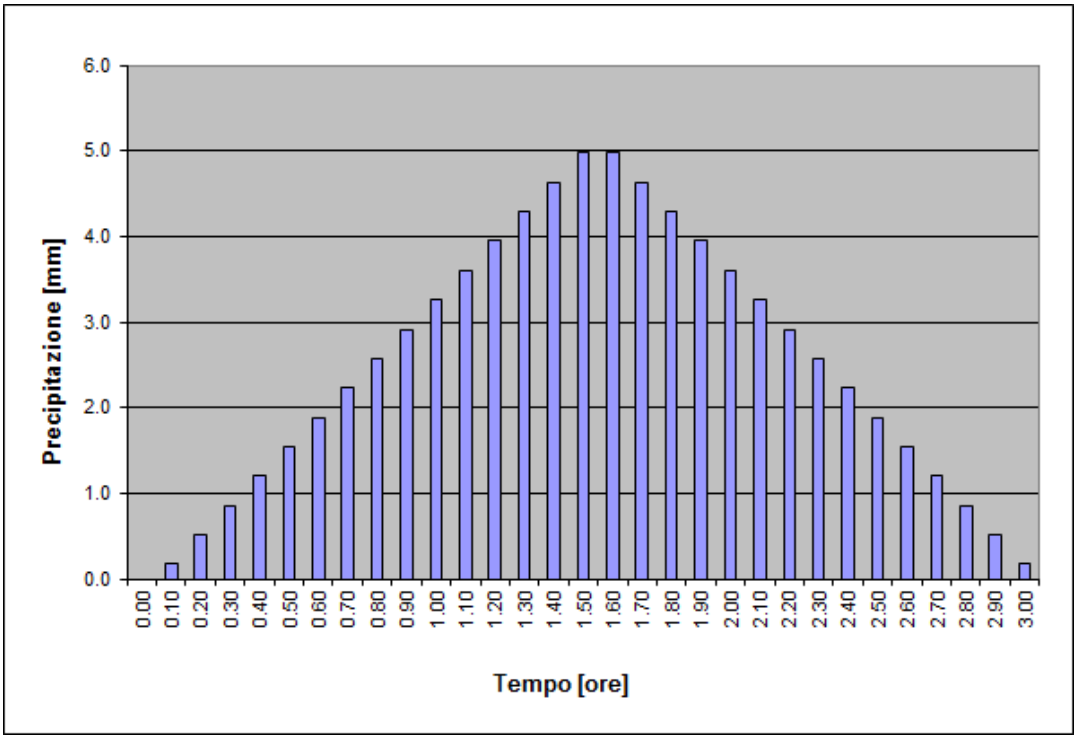


FIGURA 6-21: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 77.22MM E DURATA PARI A 3H – TR50 ANNI

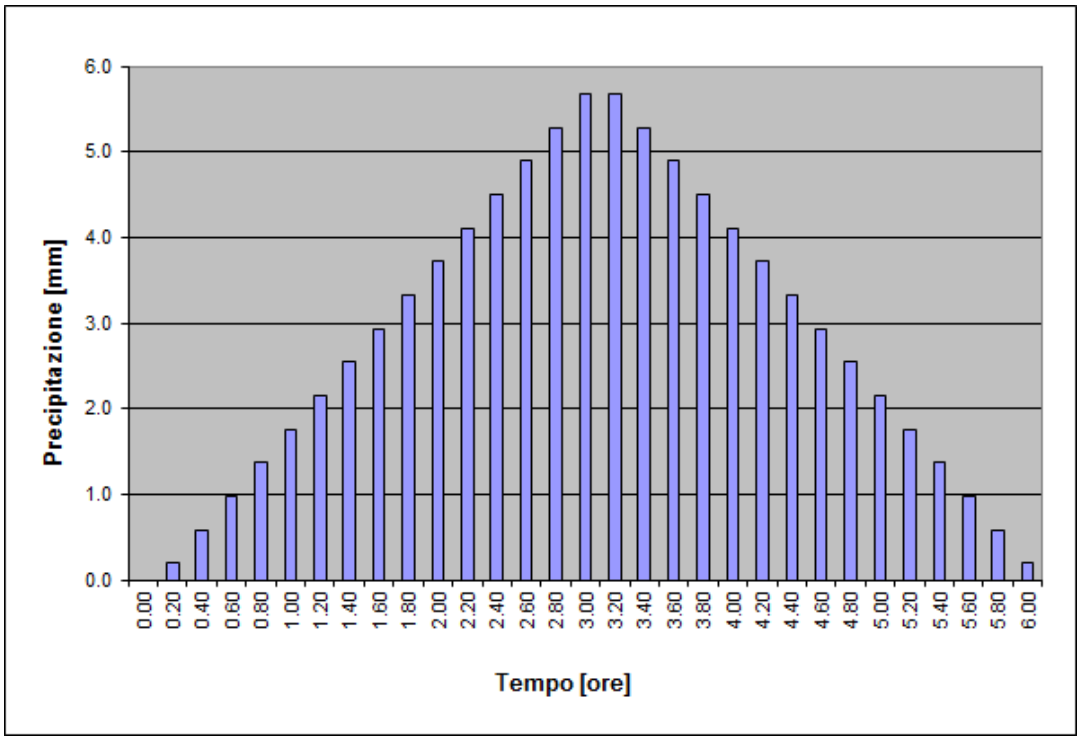


FIGURA 6-22: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 88.11MM E DURATA PARI A 6H – TR50 ANNI

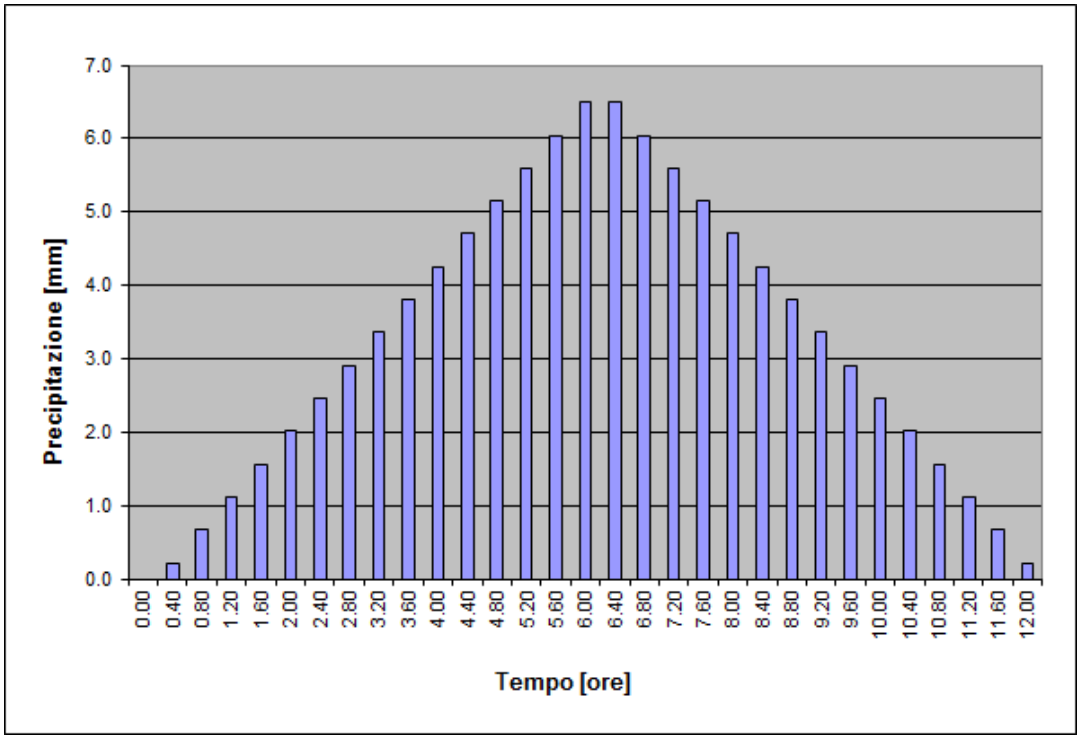


FIGURA 6-23: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 100.78MM E DURATA PARI A 12H – TR50 ANNI

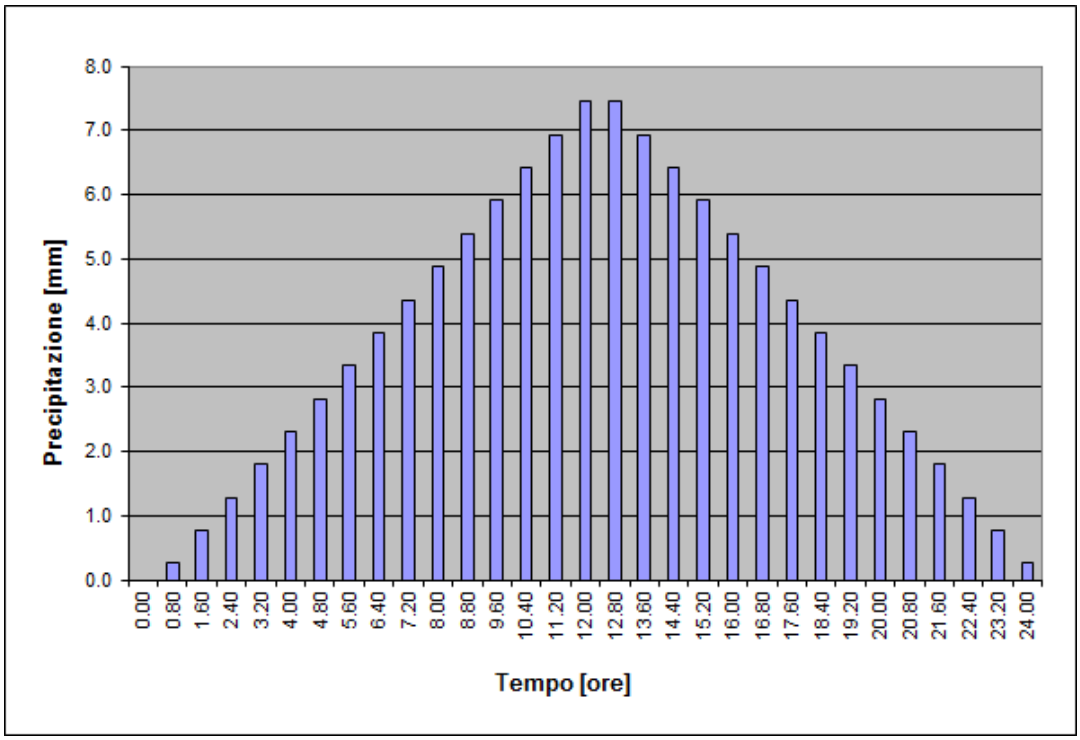


FIGURA 6-24: IETOGRAMMA DI PROGETTO – TRATTO EST: ALTEZZA DI PIOGGIA 115.53MM E DURATA PARI A 24H – TR50 ANNI

7. VERIFICHE IDRAULICHE

7.1. IL MODELLO IDROLOGICO – IDRAULICO UTILIZZATO

Il modello dinamico SWMM (Storm Water Management Model), sviluppato e aggiornato dall'agenzia federale statunitense per la protezione dell'ambiente U.S. E.P.A, descrive quantitativamente la trasformazione delle piogge in deflussi superficiali sulla superficie di un bacino imbrifero ed in correnti idriche che confluiscono e si propagano lungo i collettori.

Matematicamente il processo è rappresentato dalla soluzione di un sistema di equazioni differenziali che governano il bilancio della massa liquida (equazione di continuità) e della corrispondente energia meccanica (equazione del moto) tanto per il deflusso che si sviluppa come lama d'acqua fluente sulla superficie di una area elementare per effetto della saturazione del suolo e del superamento della sua capacità di infiltrazione, quanto del deflusso che si sviluppa come corrente essenzialmente monodimensionale in ciascuno dei tronchi elementari costituenti i collettori drenanti. Oltre tali equazioni differenziali, il modello impone contemporaneamente, attraverso ulteriori equazioni, le condizioni al contorno, ed in particolare l'identità del livello in tutti gli estremi di canali che connettono lo stesso nodo, il legame tra livello raggiunto nei nodi, dimensione fisica delle confluenze e livelli idrici nei canali riceventi.

Le condizioni iniziali nel reticolo vengono invece calcolate sulla base delle condizioni al contorno che riguardano i riceventi e della portata iniziale in ogni condotto.

Per quanto riguarda il deflusso di superficie, il programma considera ogni area elementare utilizzata per la schematizzazione dell'intero bacino come un serbatoio non lineare con un singolo ingresso che rappresenta le precipitazioni, e con più uscite che rappresentano rispettivamente l'infiltrazione, l'evaporazione ed il deflusso superficiale. È quest'ultima la componente maggiormente rappresentativa nel caso presente.

La capacità del serbatoio non lineare rappresenta la capacità massima d'accumulo sulle superfici del bacino, fornita principalmente dai micro e macro avvallamenti delle superfici e dal velo d'acqua presente sulle superfici bagnate, d'altezza variabile durante l'evento di pioggia.

Nella logica del modello il deflusso superficiale ha inizio solo quando il volume d'acqua nel serbatoio supera la capacità d'accumulo superficiale, mentre l'infiltrazione (solo nella porzione permeabile della superficie) e l'evaporazione riducono continuamente il volume d'acqua accumulato nel serbatoio. L'infiltrazione viene modellata secondo il metodo CN del Soil Conservation Service (USA). Nei casi in cui l'infiltrazione e l'evaporazione risultino potenzialmente superiori alla precipitazione, il deflusso risulta ovviamente nullo. E' presente anche la componente di deflusso ipodermico e di base, derivante dalla schematizzazione della regione sotterranea come due serbatoi non lineari interconnessi; tale elemento, introdotto quando si dispone di osservazioni in continuo delle piogge, può simulare anche gli scambi idrici fra falda freatica e corso

d'acqua, ma riveste una importanza trascurabile nella simulazione di singoli eventi di piena, come quelli analizzati in questo studio, perché i tempi di risposta dei due serbatoi sotterranei eccedono largamente quelli del ruscellamento superficiale, fornendo un contributo al deflusso totale che diviene significativo solo in regime fluviale di morbida e magra.

Il processo appena descritto, elaborato dal modulo RUNOFF del programma, viene ripetuto per ogni area elementare schematizzata, e per ogni passo temporale in cui è necessario discretizzare l'intervallo di tempo durante il quale interessa simulare la trasformazione afflussi-deflussi e la propagazione della conseguente piena lungo il sistema drenante, tenendo conto delle confluenze secondo la struttura topologica della rete di scolo.

7.1.1. Il Modulo "Runoff" di SWMM

Il modulo RUNOFF è stato sviluppato per simulare sia la quantità che la qualità dei flussi in un bacino di drenaggio ed il loro propagarsi nelle condotte della rete. Assegnatogli uno ietogramma, il programma schematizza il bacino con una combinazione di sottobacini e di condotte e/o canali ideali, e procede a svolgere un'esaustiva analisi (neve disciolta, perdite da infiltrazione nelle aree pervie, ritenzione superficiale, flusso sul terreno e nelle condotte e/o canali), che permette di determinare gli idrogrammi ed i pollutogrammi nei vari nodi. Nello studio in questione si è analizzato il problema idrico solamente dal punto di vista quantitativo, non da quello qualitativo.

7.1.1.1. Evaporazione

L'evaporazione può essere inserita nel modulo RUNOFF sia direttamente, tramite una altezza cumulata per ciascun mese, sia a partire dalla serie temporale delle temperature.

L'evaporazione è sottratta all'altezza di pioggia caduta e/o acqua stagnante prima di calcolare l'infiltrazione e lo scorrimento superficiale. Il valore della precipitazione che il programma considera è quindi sempre quello netto a cui sono già state sottratte le perdite di evaporazione.

Sebbene nel modulo RUNOFF evaporazione e infiltrazione siano sommate per formare un unico valore di perdita per i calcoli nei sottobacini, totali separati sono mantenuti nel controllo generale della continuità.

7.1.1.2. Infiltrazione

Per l'infiltrazione nelle aree pervie SWMM consente di scegliere tra 3 modelli: Horton, Green-Ampt e Curve Number. Il modello empirico di Horton è frequentemente utilizzato. Molti idrologi hanno una "sensibilità" per i tre parametri richiesti, nonostante la documentazione al riguardo sia molto scarsa. Sebbene nella sua formulazione classica l'equazione possa essere utilizzata solo qualora l'intensità di precipitazione ecceda la capacità di infiltrazione, le modifiche apportate in SWMM al modello permettono di superare questa deficienza.

Alternativamente l'equazione di Green-Ampt è un modello fisico che può consentire una buona descrizione

del processo di infiltrazione. Nella formulazione di Mein-Larson il modello può anche essere applicato in caso di intensità di precipitazione inferiore alla capacità di infiltrazione all'inizio dell'intervallo temporale.

7.1.1.3. Propagazione del flusso superficiale

Il modulo RUNOFF rappresenta l'inizio della generazione del flusso in SWMM. Ciascun sottobacino viene suddiviso in tre sottoaree che simulano le aree impermeabili, con e senza depressioni superficiali, e l'area permeabile, con depressioni superficiali. La profondità delle depressioni superficiali è un dato di input (parametro denominato WSTORE) per le aree impermeabili e permeabili di ciascun sottobacino.

Il flusso superficiale è generato da ciascuna delle tre aree approssimandole a serbatoi non-lineari, ai quali non viene assegnata alcuna forma specifica. Tuttavia, se la larghezza del sottobacino, W, è considerata come vera larghezza del flusso superficiale, allora l'area si comporterà come un bacino rettangolare. Altrimenti, la larghezza (come anche la pendenza e la scabrezza) possono essere considerati come parametri di calibrazione. Il serbatoio non-lineare è definito combinando l'equazione di continuità con quella di Manning.

L'equazione di continuità, applicata a ciascuna sottoarea:

$$\frac{dV}{dt} = A\frac{dd}{dt} = Ai^* - Q$$

dove V = A·d = volume di acqua nella sottoarea, m³

d = altezza della lama d'acqua, m,

t = tempo, s,

A = area del sottobacino, m²

i* = eccedenza di precipitazione = intensità di precipitazione /neve disciolta meno tasso di evaporazione e/o infiltrazione(m/s),

Q = velocità del flusso, m²/s,

si coniuga con l'equazione di Manning per il flusso:

$$Q = W\frac{1.49}{n}\left(d - d_p\right)^{5/3} S^{1/2}$$

dove W = larghezza del sottobacino, m,

n = coefficiente di scabrezza di Manning,

d = altezza della lama d'acqua, m,

S = pendenza del sottobacino, m/m.

Queste due equazioni sono combinate in una equazione differenziale non lineare, che può essere risolta rispetto ad un'incognita, l'altezza, d.

$$\frac{dd}{dt} = i^* - \frac{1.49 \cdot W}{A \cdot n} \cdot \left(d - d_p\right)^{5/3} S^{1/2} = i^* + WCON \cdot \left(d - d_p\right)^{5/3}$$

dove:

$$WCON = \frac{1.49 \cdot W \cdot S^{1/2}}{A \cdot n}$$

Si noti il raggruppamento della larghezza, pendenza e scabrezza in un unico parametro.

L'equazione dd/dt è risolta per ciascun intervallo temporale con un semplice schema alle differenze finite. A questo scopo, nel lato destro dell'equazione si deve considerare il flusso medio netto in ingresso ed in uscita nell'intervallo di tempo. L'intensità di precipitazione, i*, è considerata nel programma come media nell'intervallo di tempo. Il flusso medio è approssimato calcolandolo come media tra le vecchie e le nuove altezze. Quindi, denotando coi pedici 1 e 2 rispettivamente l'inizio e la fine dell'intervallo temporale, l'equazione si approssima:

$$\frac{d_2 - d_1}{\Delta t} = i^* + WCON \cdot \left[d_1 + \frac{1}{2}\left(d_2 - d_1\right) - d_p \right]^{5/3}$$

dove Δt = intervallo di tempo, (s).

Questa equazione è poi risolta in d_2 usando un'iterazione di Newton-Raphson.

Dato d_2, il flusso istantaneo alla fine dell'intervallo temporale, WFLOW è calcolato tramite l'equazione di Manning. Il flusso in uscita istantaneo è anche il valore del flusso che viene trasferito ai successivi moduli di SWMM.

Nonostante la soluzione dell'equazione alle differenze finite sia immediata e semplice, delle peculiarità esistono nel modo in cui alcuni parametri per le singole sottoaree (A1, A2 e A3) vengono specificate. In particolare, solo due valori di WCON sono calcolati, uno per l'area permeabile ed uno per l'intera area impermeabile. Così, per il calcolo delle altezza nelle sottoaree impermeabili A1 e A3 si utilizza il medesimo WCON, ottenuto utilizzando l'area impermeabile totale. Tuttavia, il flusso istantaneo è calcolato usando l'area individuale di ciascuna sottoarea (ad esempio A1 o A3). L'influenza netta per le sottoaree A1 e A3 è ottenuta riducendo le larghezze in proporzione a A1/(A1+A3) o A3/(A1+A3). Test numerici di questo schema confrontati con uno che utilizza aree individuali (con larghezze proporzionali) nel parametro WCON, indicano che si ha un risultato che può essere ritenuto soddisfacente.

Prima di eseguire questi calcoli, il programma verifica se le perdite sono maggiori dell'altezza della precipitazione più le riserve di acqua. In tal caso, le perdite (evaporazione più infiltrazione) assorbono tutta l'acqua ed il flusso è nullo. Similmente, se le perdite da sole sono sufficienti ad abbassare il livello dell'acqua al di sotto delle depressioni superficiali, la nuova altezza è calcolata solo su questa base ed il deflusso è nullo.

Lo schema computazionale si è dimostrato abbastanza stabile. L'unico caso in cui si verificano problemi di

non-convergenza (oppure un tentativo di calcolare un'altezza negativa) è quando le sottoaree sono molto piccole (pochi metri quadrati) unite a intervalli temporali molto grandi (ad esempio dieci minuti). Qualora il programma segnali un messaggio di non convergenza, normalmente si può eliminare il problema aumentando l'area in questione o riducendo l'intervallo temporale.

La propagazione dei flussi generati è stabilita separatamente per ciascuna delle tre sottoaree del sottobacino.

Il flusso superficiale è calcolato come il prodotto della velocità per altezza e larghezza, (dall'equazione di Manning (3.2) basata sulla differenza tra l'altezza totale e le depressioni superficiali).

Si noti che larghezza, pendenza e coefficiente di scabrezza di Manning sono combinati in unico parametro. Così, cambiamenti equivalenti possono essere apportati alterando uno qualsiasi dei tre parametri. Si noti anche che la larghezza e la pendenza sono uguali per le aree permeabili ed impermeabili. Il coefficiente di scabrezza di Manning e l'area relativa sono gli unici parametri disponibili per il modellatore per caratterizzare il contributo delle aree permeabili ed impermeabili nell'idrogramma di uscita.

I flussi calcolati nel modulo RUNOFF e trasferiti ai moduli successivi sono valori istantanei al tempo finale dell'intervallo.

7.1.1.4. I flussi sotterranei

La componente sotterranea simula due zone – una superiore (insatura) ed una inferiore (satura). Il flusso dalla zona insatura a quella satura è regolata da un'equazione di percolazione nella quale i parametri possono essere sia stimati che calibrati, in base alla disponibilità dei dati. L'unico flusso in entrata è l'infiltrazione calcolata dal modulo RUNOFF. L'evapotraspirazione nella zona superiore risulta l'unica causa di perdite nella zona insatura. Perdite e deflusso dalla zona inferiore possono avvenire tramite percolazione profonda, evapotraspirazione, e scorrimento sotterraneo. Il flusso sotterraneo è una funzione della tavola d'acqua ed eventualmente dell'altezza dell'acqua nel corso d'acqua di drenaggio.

Lo scorrimento sotterraneo rappresenta il flusso laterale dalla zona satura al corso d'acqua ricevente. L'equazione del flusso assume la seguente formula generale:

$$GWFLW = A1 \cdot (D1\text{-}BC)B1 - TWBC + A3 \cdot D1 \cdot BC$$

e

$$TWFLW = A2 \cdot (TW\text{-}BC)\ B2$$

dove GWFLW = velocità del flusso sotterraneo all'inizio dell'intervallo temporale (per area del sottobacino)

TWFLW = influenza della velocità del flusso dell'acqua del corso d'acqua all'inizio dell'intervallo temporale (per area del sottobacino),

A1, A2, A3 = coefficienti di influenza del flusso sotterraneo e del corso d'acqua,

B1, B2 = esponenti di influenza del flusso sotterraneo e dell'acqua nel corso d'acqua,

D1 = altezza della zona inferiore all'inizio dell'intervallo temporale,

BC = altezza del fondo del corso d'acqua,

TW = altezza dell'acqua nel corso d'acqua.

Se D1 è minore di BC o TW, GWFLW è posto uguale a zero. Inoltre se TW = BC e B2 = 0, allora la forma indeterminata zero elevato a zero è posta uguale a uno dal programma.

Poiché il flusso sotterraneo può avere notevoli dimensioni, un flusso medio è calcolato iterativamente ad ogni intervallo temporale. I flussi sotterranei possono essere indirizzati a qualsiasi nodo del reticolo drenante o a qualsiasi tratto fluviale, permettendo di isolare i vari componenti dell'idrogramma totale. Quindi il flusso sotterraneo non deve necessariamente essere indirizzato alla stessa destinazione del flusso superficiale di ogni sottobacino. L'influsso dell'acqua nel corso d'acqua sul flusso sotterraneo può essere trattato in due modi distinti. La prima opzione prevede che l'altezza dell'acqua nel corso d'acqua, TW, risulti una costante maggiore od uguale al valore dell'altezza del fondo del corso d'acqua, BC, e che A2, B2 e/o A3 abbiano valori maggiori di zero. La scelta di questo metodo equivale a specificare una influenza media dell'acqua nel corso d'acqua per tutto lo scorrimento da usare per ciascun intervallo temporale. La seconda opzione fissa l'altezza dell'acqua nel canale o fiume, TW, uguale al reale valore del tirante nel tratto considerato. Per questa impostazione, il flusso sotterraneo deve essere indirizzato ad un corso d'acqua e non ad un nodo. L'altezza idrica nel corso d'acqua (TW-BC) è poi determinata per ogni intervallo temporale come l'altezza al precedente intervallo temporale. L'altezza all'inizio dell'intervallo temporale deve essere utilizzato per evitare iterazioni complesse e lunghe nella combinazione con l'equazione della portata del corso d'acqua. A causa di questo compromesso, l'acqua sotterranea può "pulsare" all'oscillare di D1 appena sopra e sotto di TW. Questa pulsazione può introdurre errori nella continuità ed, ovviamente, non è rappresentativa del sistema reale. Intervalli temporali più corti e canali più larghi o meno pendenti (riducendo così la risposta del corso d'acqua) possono essere utilizzati per ridurre le pulsazioni. Infine, la selezione di A1, B1, A2, B2, e A3 deve essere fatta con cautela affinché GWFLW non diventi negativo. Nonostante questo possa accadere nel sistema reale, indicando un ricaricamento dal corso d'acqua, non esiste attualmente modo per rappresentare questo flusso contrario e sottrarlo dal corso d'acqua. Un modo per eludere questo è rendere A1 più grande o uguale ad A2 e B1 più grande o uguale a B2, e B3 uguale a zero.

7.1.2. Il modulo "extran" di SWMM (propagazione nel reticolo idrografico)

Il deflusso superficiale raggiunge la rete drenante e la sua propagazione viene simulata risolvendo, per ogni tubazione, il seguente sistema di equazioni differenziali alle derivate parziali rappresentanti l'equazione di bilancio di massa

$$\frac{\partial Q}{\partial x} + \frac{\partial A}{\partial t} = 0$$

e l'equazione del momento della quantità di moto

$$g \cdot A \cdot \frac{\partial H}{\partial x} + \frac{\partial (Q^2 / A)}{\partial x} + \frac{\partial Q}{\partial t} + g \cdot A \cdot S_f = 0$$

con

$$S_f = \frac{Q \cdot |v|}{n^2 \cdot A \cdot R^{4/3}}$$

dove:

- Q è la portata nel condotto funzione del tempo e dello spazio,
- x l'ascissa longitudinale del condotto, variabile indipendente spazio,
- A è la sezione del condotto di fognatura,
- t la variabile indipendente tempo,
- g l'accelerazione di gravità,
- H è il carico piezometrico z+y, con z quota di fondo alveo e y tirante idrico,
- Sf la pendenza della linea dei carichi,
- R è il raggio idraulico del condotto,
- v la velocità media nel condotto,
- n il suo coefficiente di scabrezza secondo Manning.

Oltre alle equazioni differenziali descritte, il modello impone contemporaneamente, attraverso ulteriori equazioni, le condizioni al contorno, ed in particolare l'identità del livello in tutti gli estremi di tratti fluviali che connettono lo stesso nodo, il legame tra livello raggiunto nei nodi, dimensione fisica delle confluenze e livelli idrici nei tratti riceventi.

Le condizioni iniziali nei tronchi vengono invece calcolate sulla base delle condizioni al contorno che riguardano i riceventi e della portata iniziale in ogni tratto.

7.2. I PARAMETRI AL CONTORNO

Tutti i sottobacini relativi alla piattaforma stradale, nel caso di verifiche degli elementi di drenaggio, hanno le seguenti caratteristiche:

- Lama d'acqua di detenzione superficiale: 1.27mm;
- Coefficiente di scabrezza secondo Manning: 0.011 $(m^{1/3}/s)^{-1}$;
- Pendenza: 2.5% - 7% a seconda che il tratto studiato sia in rettilineo o in curva;
- CN: 100;
- Coefficiente di deflusso φ=1.0.

Tutti i sottobacini relativi alla piattaforma stradale, nel caso di verifiche dei fossi di guardia, hanno le seguenti caratteristiche:

- Lama d'acqua di detenzione superficiale: 1.27mm;
- Coefficiente di scabrezza secondo Manning: 0.011 ($m^{1/3}/s)^{-1}$;
- Pendenza: 2.5% - 7% a seconda che il tratto studiato sia in rettilineo o in curva;
- CN: 80;
- Coefficiente di deflusso φ=0.9.

Tutti i sottobacini relativi alle scarpate hanno invece le seguenti caratteristiche:

- Lama d'acqua di detenzione superficiale: 2.54mm;
- Coefficiente di scabrezza secondo Manning: 0.05 ($m^{1/3}/s)^{-1}$;
- Pendenza: 67% (equivale ad una scarpata 2 su 3);
- CN: 80.
- Coefficiente di deflusso φ=0.5-0.6

Tutti i sottobacini comprendenti l'area di scolo proveniente dai campi hanno le seguenti caratteristiche:

- Lama d'acqua di detenzione superficiale: 2.54mm;
- Coefficiente di scabrezza secondo Manning: 0.05 (m1/3/s)^-1;
- Pendenza: 0.01%;
- CN: 70.
- Coefficiente di deflusso φ=0.3-0.4

In realtà, per il coefficiente di deflusso il relativo valore viene calcolato direttamente dal modello matematico applicato per la trasformazione Afflussi/Deflussi come descritto nella parte precedente del presente Capitolo.

8. VERIFICHE IDRAULICHE E DIMENSIONAMENTO DEI MANUFATTI DI MODULAZIONE, EVACUAZIONE, TRATTAMENTO E LAMINAZIONE DELLA PIATTAFORMA STRADALE

8.1. SISTEMI DI RACCOLTA ED EVACUAZIONE

Il sistema di drenaggio stradale è esteso a tutto il tracciato e comprende la raccolta delle acque del nastro pavimentato, delle banchine laddove presenti e di tutte le superfici impermeabili interessate dal traffico, comprese le scarpate dei rilevati.

Il sistema di evacuazione delle acque di piattaforma è di tipo chiuso, infatti tutti i collettori adottati sono impermeabili. Le acque raccolte sono convogliate attraverso gli embrici direttamente nei fossi di guardia laterali. Questi svolgono l'azione biunivoca di collettamento e laminazione. Per garantire l'impermeabilità si prevede che i fossi siano realizzati con le seguenti protezioni:

a) in corrispondenza degli acquiferi critici (in presenza di vulnerabilità media, medio-alta e alta – vedi tavole P00ID00IDRPP01A-02A-03A), per il fondo del fosso compreso le sponde e fino alla sommità bagnata, si è prevista la posa di un materassino bentonitico (a base di bentonite sodica) con il ricoprimento di uno strato vegetale di 20cm;

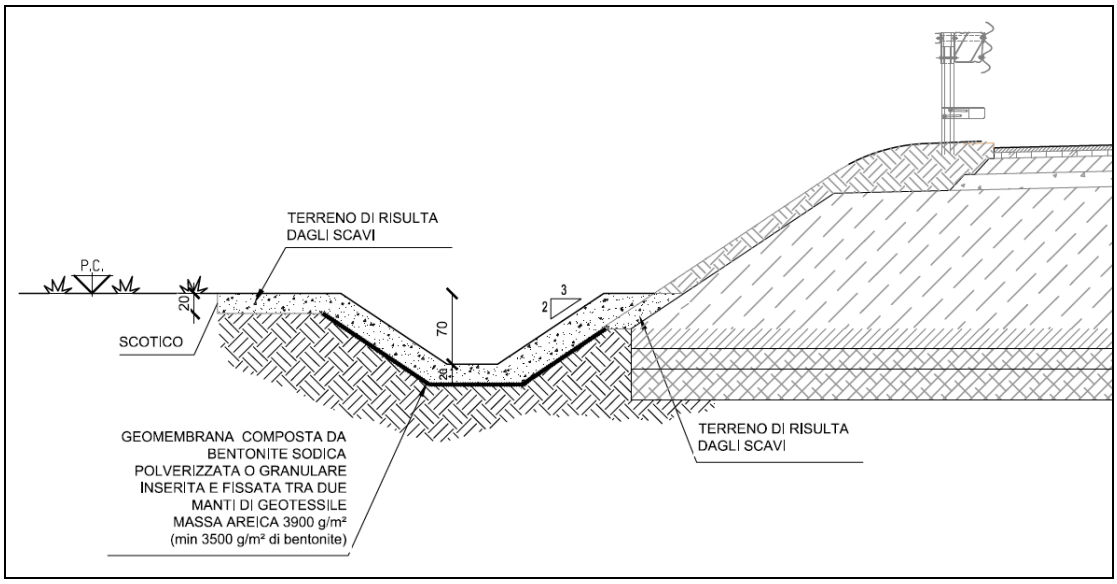


FIGURA 8-1: FOSSO DI GUARDIA MUNITO DI MATERASSINO BENTONITICO

b) negli altri casi, il fondo dei fossi di guardia sarà realizzato con materiale prevalentemente di matrice argillosa con ricoprimento di strato vegetale;

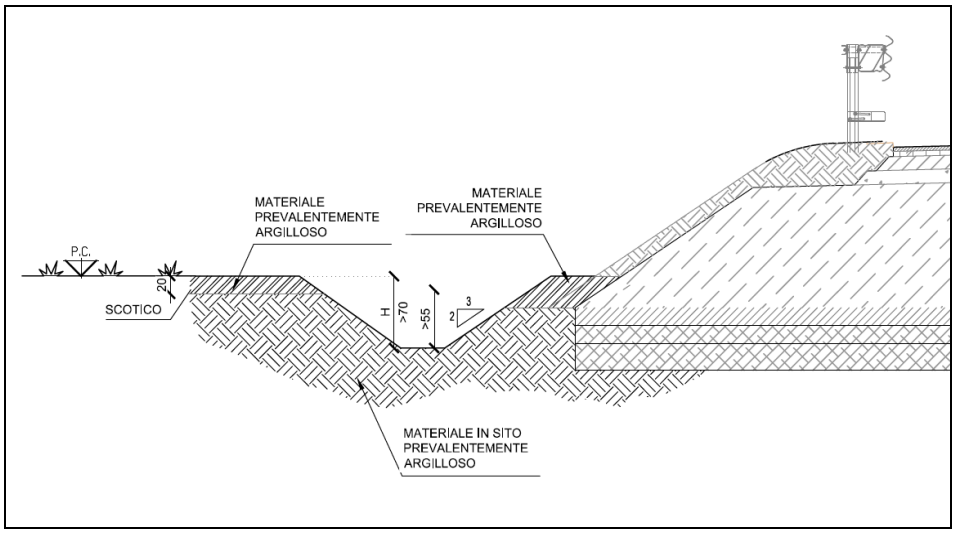


FIGURA 8-2: FOSSO DI GUARDIA REALIZZATO CON MATERIALE PREVALENTEMENTE DI MATRICE ARGILLOSA

In corrispondenza degli scarichi degli embrici e dei tubi di scarico dei tratti in curva è previsto un rivestimento in cls sul fondo e sulle sponde del fosso per una larghezza pari a 1m.

Le acque raccolte nei fossi di scolo stradale confluiscono per gravità verso gli impianti di trattamento in continuo che si trovano nelle vicinanze del corpo idrico ricettore. I fossi posti a nord e a sud del rilevato stradale, vengono messi in collegamento tra loro generalmente tramite tombini in cls Ø1000mm sigillati nei giunti per garantire una perfetta tenuta idraulica; talvolta, nel caso delle rampe di connesione alla tangenziale o per le altre viabilità secondarie, dove il ricoprimento è minimo, sono stati previsti anche tombini con diametro minore, comunque mai inferiore al Ø400mm. Lo schema di raccolta delle acque permette di ottenere anche il beneficio di ottimizzare la depurazione attraverso un solo impianto per entrambi i sensi di marcia.

Nei fossi di guardia (previsti di 6 tipologie, vedi tavola P00ID00IDRST03A) o nelle vasche di laminazione le acque vengono convogliate verso un manufatto di invito da cui parte una tubazione in c.a. Ø600 baulata in cls indirizzata all'impianto di depurazione.

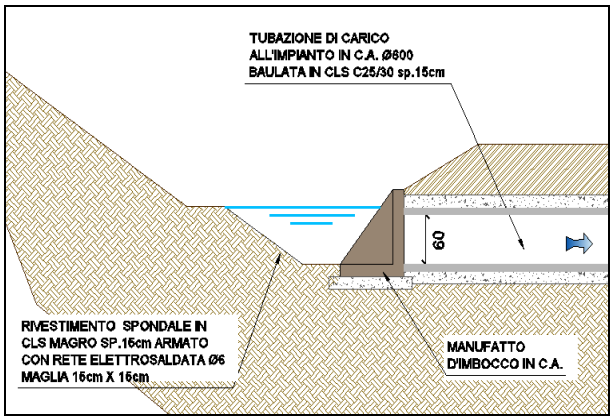


FIGURA 8-3: MANUFATTO DI INVITO PER FOSSO DI GUARDIA

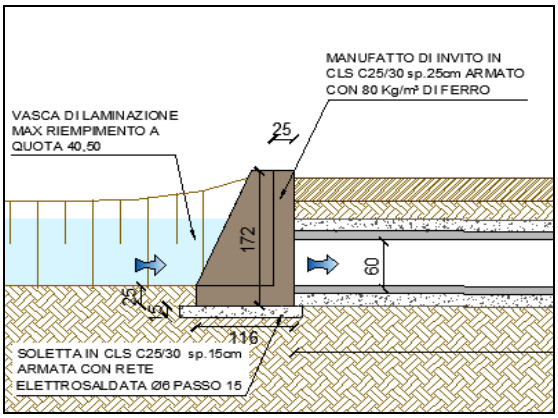


FIGURA 8-4: MANUFATTO DI INVITO PER VASCA DI LAMINAZIONE

Il tubo Ø600 in c.a. è collegato ad un pozzetto prefabbricato in C.A. posto a monte dell'impianto di depurazione, dotato di paratoia monosettore 70cmx70cm regolabile con volantino, che svolge la funzione di intercetto in caso di sversamento accidentale. Da qui l'acqua, a portata controllata, giunge all'impianto di depurazione mediante un manufatto di imbocco, costituito da un tubo in PVC il cui diametro, variabile tra il Ø200 e il Ø315, dipende dalle portata massima scaribaile nel corpo recettore.

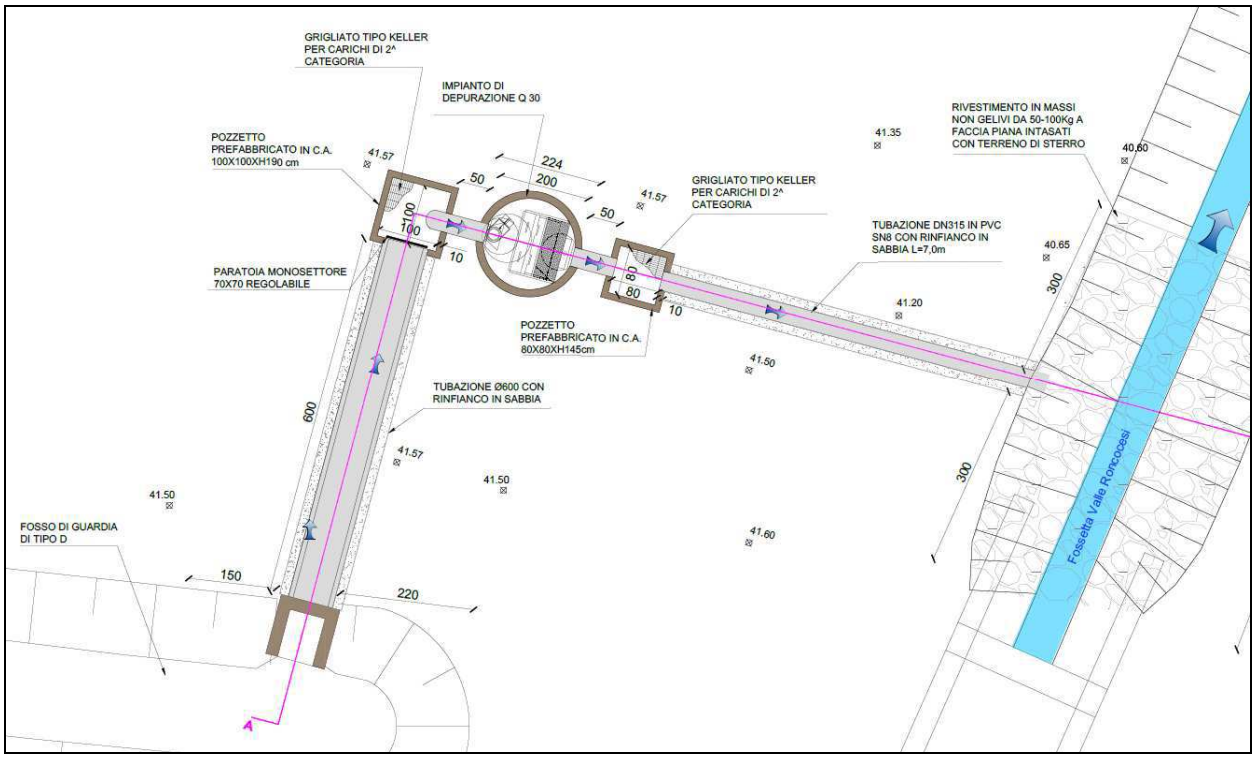


FIGURA 8-5: SCHEMA DI DEPURAZIONE DELLE ACQUE DI PIATTAFORMA

A valle dell'impianto, prima dello scarico, viene inserito un pozzetto per il monitoraggio ed il controllo della qualità delle acque da parte di ARPA e in autocontrollo.

Il sistema di gestione delle acque di piattaforma, così progettato, consente di compensare l'aumento di carico idraulico gravante sui corsi d'acqua recettori dovuto all'incremento di impermeabilizzazione del suolo generato dall'opera stradale e di restituire sempre al territorio un'acqua depurata in qualunque condizione di pioggia.

Il progetto dei fossi di laminazione è legato essenzialmente alla determinazione della capacità di invaso, ovvero al volume disponibile per l'accumulo. Il dimensionamento idraulico è stato sviluppato adottando il concetto della "invarianza idraulica": ciò significa far si che la trasformazione di un'area non provochi un incremento della portata nei corpi idrici riceventi. I fattori che influiscono nel processo di laminazione sono tre: il volume dell'invaso, la sua geometria e le caratteristiche della bocca di scarico. Solitamente la geometria dell'invaso e le caratteristiche della bocca di scarico vengono definite a priori, salvo successivi affinamenti, quindi l'unica incognita rimane il volume che è necessario assegnare all'invaso per ridurre la

portata massima in uscita al valore $Qu,_{max}$ comunque inferiore al valore della portata massima entrante $Qe,_{max}$.

La sezione stradale ha pendenza trasversale minima i_{min}=2.5%, e può raggiungere i valori massimi nei tratti in curva con i_{max}=7%; la pendenza immerge verso l'esterno carreggiata nei tratti in rettifilo e in quelli in curva per il tratto di strada di categoria C1, mentre immerge verso l'interno nei tratti in curva esterna per il tratto di strada di categoria B. Le acque di piattaforma convergono, per scorrimento superficiale, verso la banchina esterna o verso lo spartitraffico intermedio a seconda dell'andamento planimetrico.
Nei tratti in rilevato la banchina è contenuta da un arginello in terra di altezza minima h=10 cm al cui piede, lato strada, scorrono le acque di dilavamento. La raccolta centrale, in corrispondenza dello spartitraffico avviene per diretta caduta delle acque nella canaletta centrale prefabbricata in cls.
Nei viadotti le acque scorrono al margine della banchina. Nel caso dei sottovia e della trincea di Corte Tegge le acque scorrono a lato della banchina catturate con una canaletta prefabbricata in cls posizionata al di sotto del profilo redirettivo che al massimo ogni 24m scarica nel collettore di raccolta che a sua volta convoglia le acque nella vasca di accumulo.
Nei tratti in rilevato la cattura delle acque di piattaforma avviene con caditoia a tegola ad angoli smussati e raccordo inclinato agli embrici. Il trasferimento delle acque avviene con gli embrici che convogliano le acque dalla piattaforma al fosso di guardia opportunamente rivestito, in quel tratto, per 1.0m in calcestruzzo armato con rete elettrosaldata diam 6mm maglia 15x15.
Nei tratti in curva per strada di categoria B, dalla canaletta prefabbricata in cls, dei tubi Ø200mm in PVC posti ogni 20m convogliano le acque ai collettori $Ø_{int}$ 350/400mm, che attraverso delle tubazioni di diametro interno 315mm poste a distanza minima di 60m l'una dall'altra, scaricano nel fosso di guardia.
Nei tratti in viadotto la cattura avviene con solco nel marciapiede che convoglia le acque in una vasca in acciaio INOX dotata di bocchettone di raccordo al pluviale di evacuazione e da questo al collettore.

La distanza progettuale adottata come intervallo per il posizionamento degli elementi di cattura e degli embrici di allontanamento delle acque dalla pavimentazione è variabile a seconda del posizionamento plano-altimetrico; essa consente, come verificato più oltre, di raccogliere le acque di dilavamento nelle condizioni pluviometriche di progetto lungo tutto il tracciato verificando le imposizioni impartite da ANAS all'interno del proprio Capitolato d'Oneri.

La pendenza minima dei collettori di raccolta delle acque di piattaforma in rilevato deve essere pari allo 0,1%. Il passo degli scarichi nei fossi di guardia è pari a 60m tranne nei tratti con cambio di pendenza e nei punti finali della tubazione di collettamento dove è pari a 10m.

8.2. VERIFICHE IDRAULICHE DI PIATTAFORMA STRADALE

8.2.1. Idraulica dei fossi di guardia e dei tombini di collegamento

L'analisi idraulica ha lo scopo di definire le dimensioni dei fossi di raccolta delle acque provenienti dalla piattaforma stradale e dalle adiacenti scarpate, compreso le piazzole e gli allargamenti. Oltre al dimensionamento dei fossi, l'analisi ha riguardato il dimensionamento e il posizionamento dei tombini idraulici necessari per fare comunicare i fossi a nord e sud della viabilità in progetto.

Nella tabella seguente sono riportate le dimensioni dei fosso di guardia utilizzati.

Tabella 8-1: Dimensioni fossi di guardia

TIPO	B (m)	b (m)	h (m)	PENDENZA SPONDE
Fosso A	1.50	0.50	0.50	1/1
Fosso B	2.60	0.50	0.70	2/3
Fosso C	3.10	1.00	0.70	2/3
Fosso D	4.00	1.60	0.80	2/3
Fosso E	7.00	1.00	1.00	1/3
Fosso F	8.00	4.40	1.20	2/3

Le caratteristiche degli elementi di input sono quelle definite al paragrafo 7.2.

Nella modellazione sono stati implementati gli ietogrammi corrispondenti a piogge di durata 1,1.5, 2, 2.5, 3, 6, 12 e 24 ore al fine di valutare la capacità laminativa dei fossi. A seconda del recettore si può avere una portata di scarico variabile tra 3 e 20 l/s*ha (vedi Tabella 5-1). I fossi, con forma geometrica definita a seconda dei casi ed a pendenza minima variabile tra 0.1% e 0.6%, garantiscono il corretto deflusso delle acque fino all'impianto di depurazione in continuo ed una corretta laminazione, per eventi di pioggia intensi e di breve durata per T_R assegnato, mantenendo sempre ed ovunque un modesto quanto importante franco di sicurezza.

Di seguito si illustrano le modalità di raccolta e laminazione dei diversi tratti stradali analizzati suddivisi per singolo scarico.

8.2.1.1. Torrente Crostolo

Il tratto sotteso dallo scarico nel torrente Crostolo, compreso tra la Pk 00+100.00 e la Pk 00+337.13, si sviluppa interamente in curva ed è parzialmente in rilevato ed in gran parte in viadotto. I fossi di guardia di tipo B, base maggiore pari a 2.60m e altezza 0.70m con pendenza delle sponde 2/3, sono previsti lato nord tra la Pk 00+090.00 e la Pk 00+175.00 e lato sud tra la Pk 00+130.00 e la Pk 00+180.00. Questi sono collegati ad un sistema di condotte costituite da tubi del Ø800 in C.A che ricevono, oltre alle acque scaricate dai fossi, anche le acque della piattaforma del viadotto tramite pluviali che scendono e scaricano in pozzetti

prefabbricatai in CA 150cmx120cm posti in corrispondendenza delle pile del viadotto stesso.

L'immagine seguente rappresenta il sistema di scarico precedentemente descritto, in cui si vede il pozzetto in CA posto alla base di ciascuna pila, sia per la carreggiata nord che per quella sud. Verso tale pozzetto converge e poi diparte una condotta Ø800 in C.A che alla Pk 00+337.13 recapita le acque all'impianto di depurazione denominato "ID10" posto in prossimità dell'argine destro del Crostolo, dopodichè, tramite l'impianto di sollevamento denominato "IS08", le acque depurate, vengono scaricate nel corpo idrico recettore.

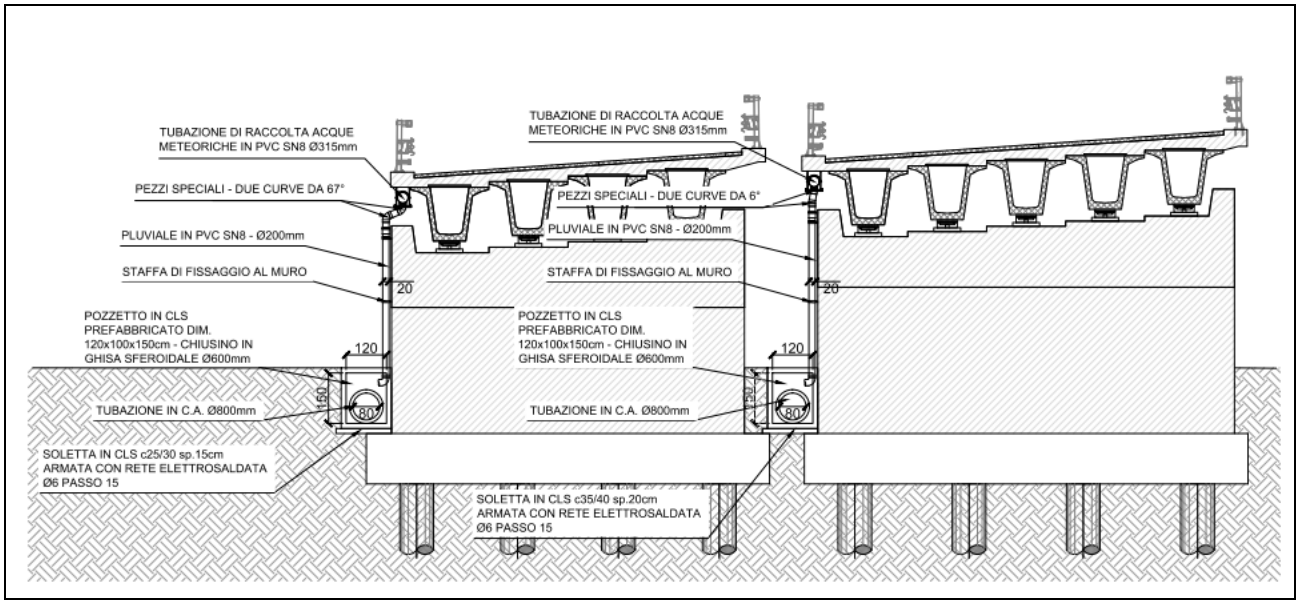


Figura 8-6: Sistema di scarico e recapito delle acque di piattaforma verso la depurazione

L'intero tratto si sviluppa in un'area caratterizzata da un grado di vulnerabilità medio, quindi i fossi di guardia previsti sono dotati di materassino bentonitico con ricoprimento di 20cm di terreno vegetale per garantire la protezione dell'acquifero.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 30m;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Est.

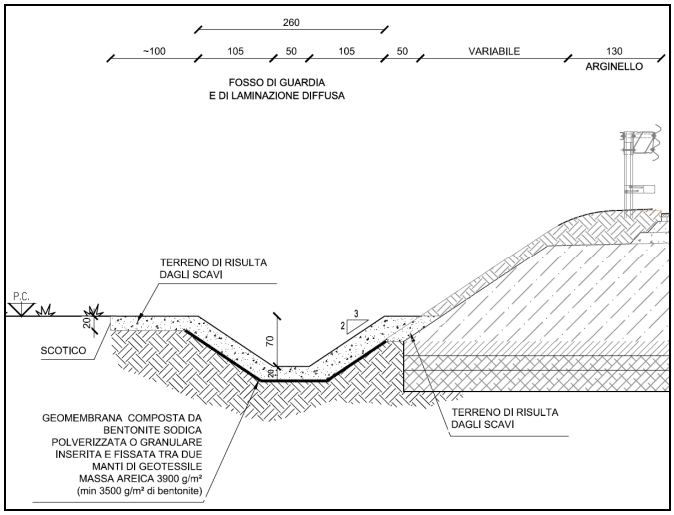
Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 2 ore. In tali condizioni i fossi di guardia ed il sistema di condotte del Ø800 previsti, garantiscono un volume di laminazione di circa 315m^3 a fronte di una superficie impermeabile 0.57ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m^3/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

8.2.1.2. Fossetta S. Giulio

Il tratto sotteso dallo scarico nella Fossetta S.Giulio è compreso tra la Pk 00+310.25 e la Pk 01+375.00, si sviluppa interamente in curva, comprendendo, oltre al rilevato della tangenziale, anche un tratto del Viadotto a est del T. Crostolo, l'intero ponte sul corso d'acqua stesso, ed una quota parte della Rampe 2 dello svincolo denominato "Rete 2".

Il tratto in oggetto è caratterizzato da una doppia curva, la prima verso nord e la successiva verso sud. Per il primo tratto si prevede un fosso di tipo B interno curva che raccogli tutte le acque della piattaforma stradale e della scarpata nord, mentre a sud è previsto un fosso di tipo A esterno curva che raccogli le sole acque della scarpata. Questi due fossi sono collegati tra loro da un tombino circolare Ø1000 in CA all'altezza di Casa Castellani al Km 00+695; oltre tale abitazione, sempre in carreggiata sud, riprende il Fosso A che scarica direttamente nella Fossetta San Giulio le sole acque della scarpata della tangenziale.



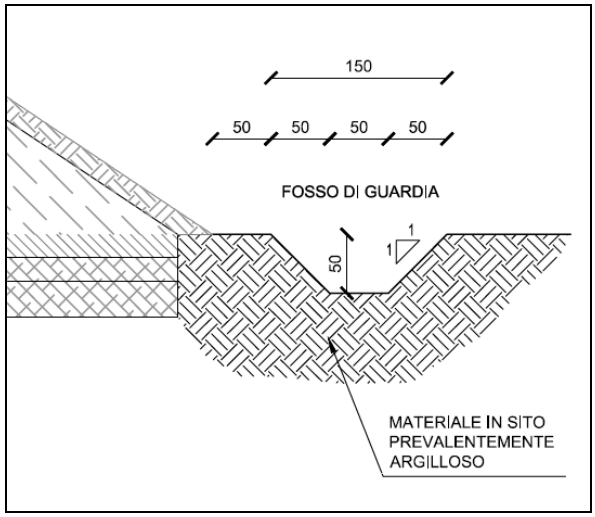
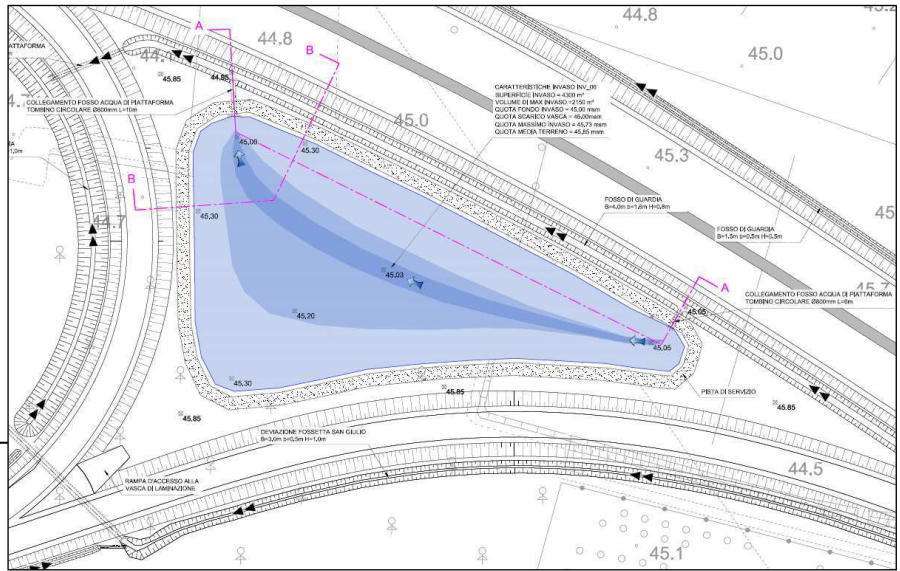


Figura 8-7: **Fosso Tipo "B" a sinistra e Fosso tipo "A" a destra**



Dalla Pk 00+970 inizia la curva veso sud, quindi tutte le acque della piattaforma stradale e della scarpata sud sono raccolte all'interno di un fosso di tipo D, base maggiore di 4,00m, base

minore di 1,60m ed altezza di 0,80m. Questo fosso è collegato, tramite due tombini circolari Ø1000 in CA, all'invaso di laminazione denominato"INV_06" posto all'interno dell'area interclusa tra l'asse principale e le rampe 1 e 2. Tale invaso garantisce un volume massimo di laminazione pari a 2900m³.

Figura 8-8: Invaso di laminazione INV_06

Le acque defluiscono dal precedente Fosso D verso un fosso di tipo E, tramite tombino circolare Ø1000 in CA posto alla Pk00+135 della Rampa 2. Il Fosso E, che funge da laminatore per l'importante dimensione della sua superficie di deflusso pari a 4,0m^2, convoglia le acque di piattaforma verso l'impianto di depurazione denominato "ID01". Questo, una volta trattate, le scarica con una portata massima di 16l/s nella Fossetta San Giulio, rispettando il limite udometrico di scarico imposto dal Consorzio di Bonifica pari a 3.0l/(s*ha) per una superficie di scolo totale di circa 5,3ha.

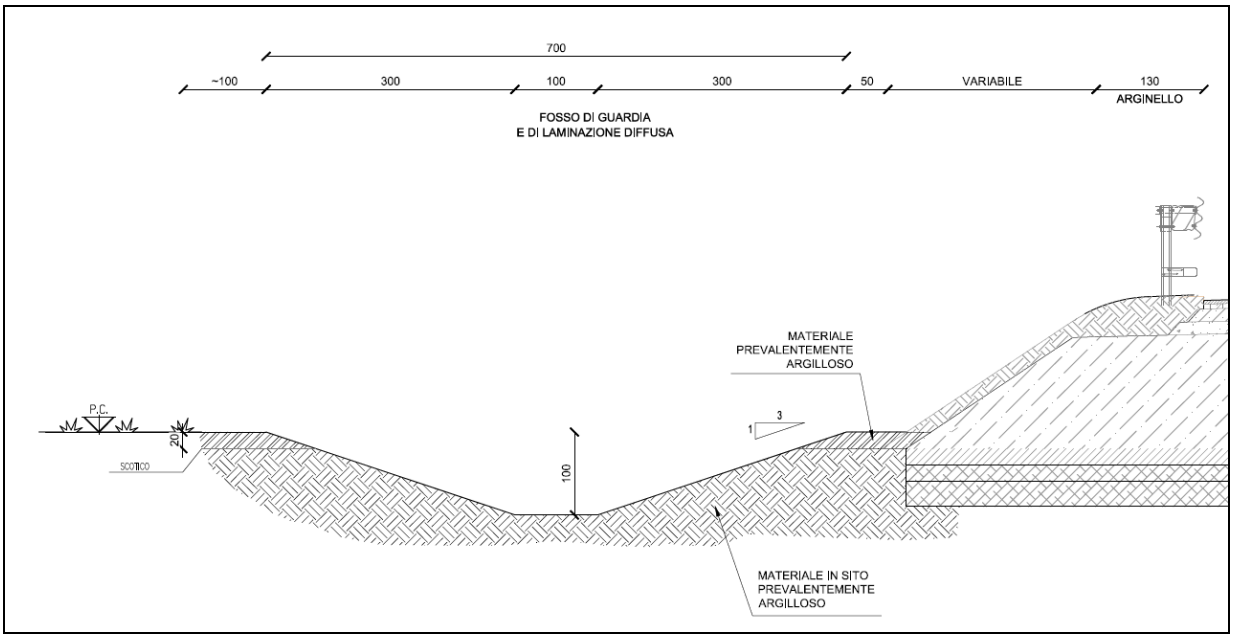


Figura 8-9: Fosso Tipo E

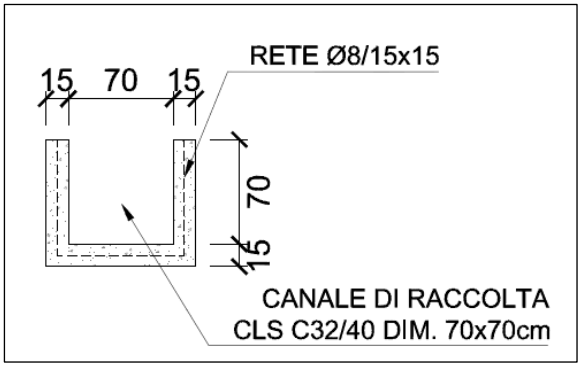


Figura 8-10: Cnaletta in cls 70x70cm

Per il breve tratto di tangenziale tra la PK 01+335 alla PK 01+375 le acque vengono scaricate all'interno di una canaletta in cls 70x70cm, armata con rete metallica elettrosaldata Ø8 maglia 15x15cm, posta circa alla base della scarpata stradale, ad una quota tale da non interferire con i due tombini circolari in CA denominati TM03 e TM06 che hanno, in quel punto, un ricoprimento inferiore a 50 cm. La canaletta è collegata al fosso tipo E che scarica le acque da trattare nell'impianto di depurazione precedentemente citato.

Il tratto di strada in esame ricade all'interno di un area caratterizzata da una vulnerabilità dell'acquifero variabile da media ad elevata, quindi è necessario prevede la protezione dello stesso, mediante la posa di materassino bentonitico con ricoprimento di 20cm di terreno vegetale, per la vasca di laminazione e per i soli fossi che raccolgono le acque da trattare ovvero quelle cadute sulla piattaforma stradale.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 30m;
- la larghezza delle rampe pari a circa 10m;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Est.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 24 ore. In tali condizioni l'invaso di laminazione e i fossi di guardia garantiscono un volume d'invaso di circa 4027m^3 a fronte di una superficie impermeabile 3.60ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

Per il tratto di tangenziale esterno curva tra la Pk 00+750 e la Pk 01+325, contraddistinto dalla sola scarpata stradale, così come per la Rampa 1 e per le viabilità secondarie a nord della tangenziale sono stati previsti fossi di guardia tipo A che raccolgono e scarico direttamente le acque nei corpi idrici recettori più vicini, rappresentati dalla Fossetta San Giulio e dalla Fossetta Baratto.

8.2.1.3. Cavo Guazzatore

Il tratto sotteso dallo scarico nel Cavo Guazzatore è compreso tra la Pk 01+375.00 e la Pk 01+960.00, si sviluppa interamente in curva ad eccezione di un piccolo tratto di rettilineo tra le Pk 01+589.50 e 01+644.39. Tale tratto comprende, oltre all'apporto idrico del rilevato della tangenziale, anche di quello dalle Rampe 3 e 4 dello svincolo di "Rete 2".

I fossi di guardia che ricevono e scaricano le acque della piattaforma stradale in esame sono tutti di tipo B; questi sono collegati tramite tre tombini circolari Ø1000 in CA ad un invaso di laminazione denominato "INV_01" posto all'interno dell'area

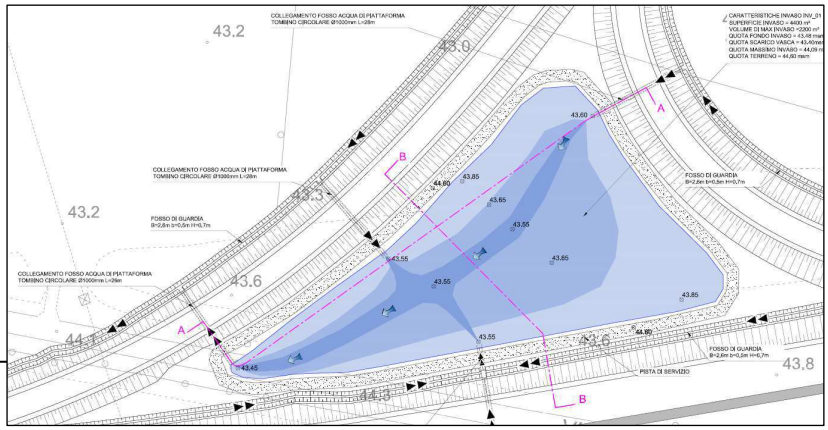


Figura 8-11: Invaso di laminazione INV_01

interclusa tra l'asse principale e le rampe 3 e 4. Tale invaso garantisce un volume massimo di laminazione pari a 2800m³.

Dall'invaso le acque sono convolgite tramite il fosso di guardia all'impianto di depurazione denominato "ID02", che, una volta trattate, le scarica con una portata massima di 14l/s nel Cavo Guazzatore, rispettando il limite udometrico di scarico imposto dal Consorzio di Bonifica pari a 3.0l/(s*ha) per una superficie di scolo totale di circa 4.7ha.

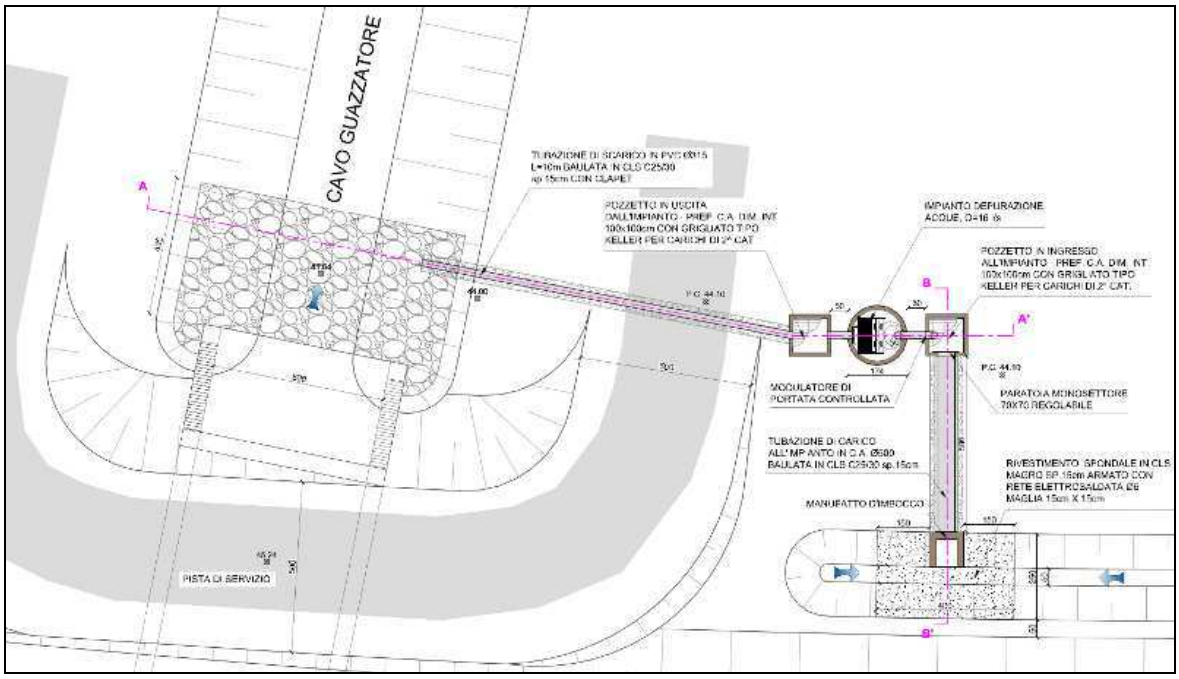


Figura 8-12: Particolare planimetrico dello scrico nel Cavo Guazzatore

Fino alla Pk 01+500.00 il tracciato stradale si trova in un'area caratterizzata da un grado di vulnerabilità elevato, quindi i fossi ricadenti in tale area sono dotati di materassino bentonitico con ricoprimento di 20cm di terreno vegetale. Dalla Pk 01+500.00 l'acqufero è caratterizzato da un grado di vulnerabilità basso, quindi per i fossi di guardia ricadenti in tale area non è necessario il materassino bentonitico, bensì sono realizzati con materiale prevalentemente argilloso in grado di garantire una buona tenuta idraulica.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 27m;
- la larghezza delle rampe pari a circa 10m;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Est.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 24 ore. In tali condizioni il solo invaso di laminazione, senza considerare il contributo laminativo dei fossi di guardia, garantisce un volume d'invaso di 2800m^3 a fronte di una superficie impermeabile 2.40ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

A sud della tangenziale tra la Pk 01+375 e la Pk 01+685, è previsto un fosso di collegamento idraulico di tipo 2, base maggiore di 2,50m, base minore di 0,50m ed altezza di 1,00m, posto a circa 5,0m dal ciglio esterno del fosso di guardia stradale e collegato tramite tombino poderale Ø500 in CA ad un fosso di guardia tipo A. Questi fossi, assolvono la funzione di scolo delle acque che cadono sui campi posti tra la ferrovia MI-BO e la tangenziale, la cui morfologia deprime verso Nord-Ovest. Lo scarico avviene nel Cavo Guazzatore tramite tombino Ø500 in CA.

8.2.1.4. Fossetta Valle Pieve Modolena Est

Il tratto sotteso dallo scarico nella Fossetta Valle Pieve Modolena Est è compreso tra la Pk 01+960.00 e la Pk 03+193.00 e si sviluppa parte in curva e parte in rettilineo. Tale tratto comprende, oltre all'apporto idrico del rilevato della tangenziale, anche di quello del sottovia ciclabile di Via Ferraroni e di una quota parte delle Rampe 1 e 2 dello svincolo denominato di "Pieve Modolena".

I fossi di guardia previsti sono di tipo A, B e C fino alla Pk 02+950.00, mentre subito a valle è previsto un fosso tipo F, , base maggiore di 8,0m, base minore di 4,40m ed altezza di 1,20m, che assieme alla vasca di laminazione denominata "INV_02" di volume pari a 1650m³, garantiscono un volume d'invaso totale di circa 3230m^3 a fronte di una superficie impermeabile 3.70ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

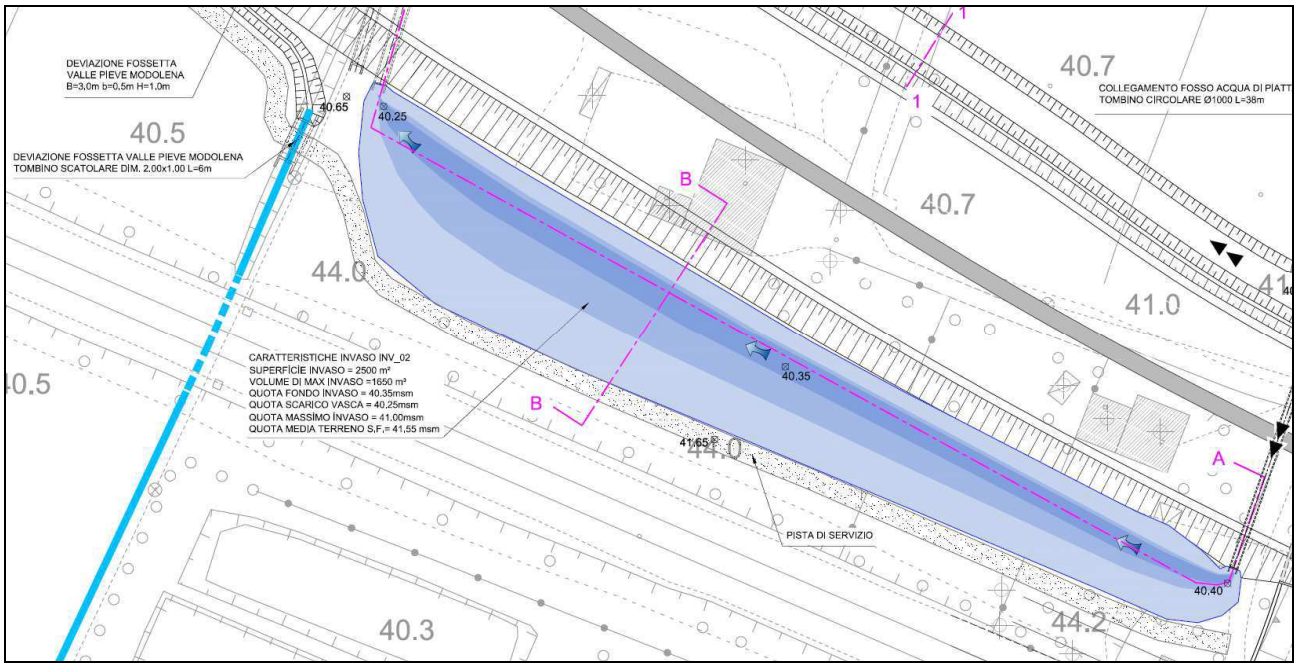


Figura 8-13: Invaso di laminazione INV_02

Alla Pk 02+420 i fossi di guardia sovrappassano il tombino circolare Ø1000 in CA denominato "TM17" che garantisce la continuità idraulica del Fosso n°3. In corrispondenza dell'attraversamento idraulico della Fossetta Ballanleoche, rappresentato dal tombino scatolare 3.00x2.50 in CA denominato "TM09", le acque della piattaforma stradale sono tutte convogliate nel fosso a nord della tangenziale e, poichè non è possibile scaricarle nella fossetta omonima, è stato previsto un manufatto di collegamento tra i fossi di guardia. Questo è costituito da uno scatolare 1.00x0.50m in CA denominato "TM52", che sovrapassa lo scatolare TM09, collega i fossi di guardia e consente di non scaricare nel Ballanleoche.

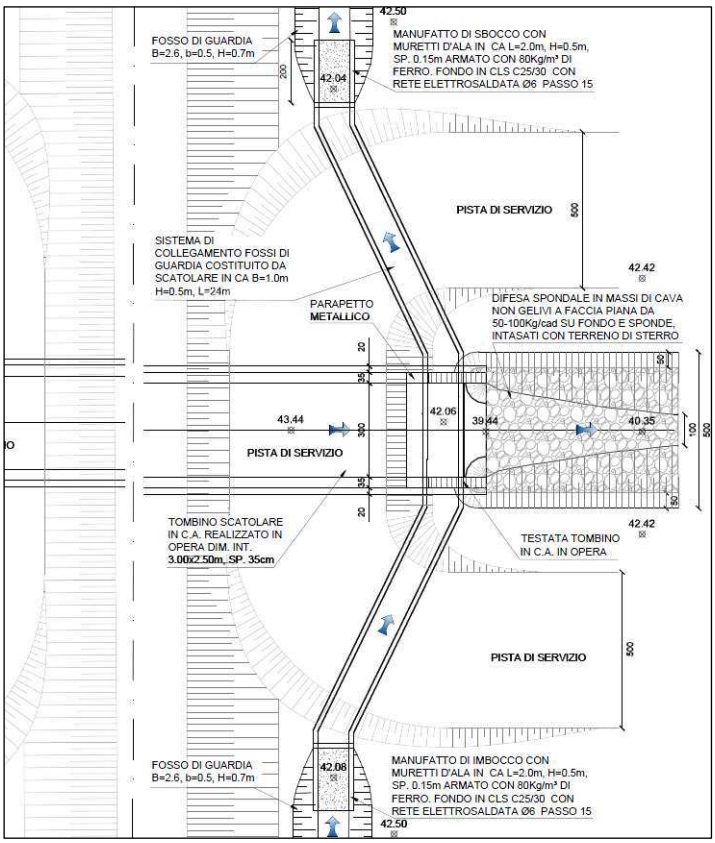


Figura 8-14: Particolare planimetrico del sovrappasso idraulico della Fossetta Ballanleoche

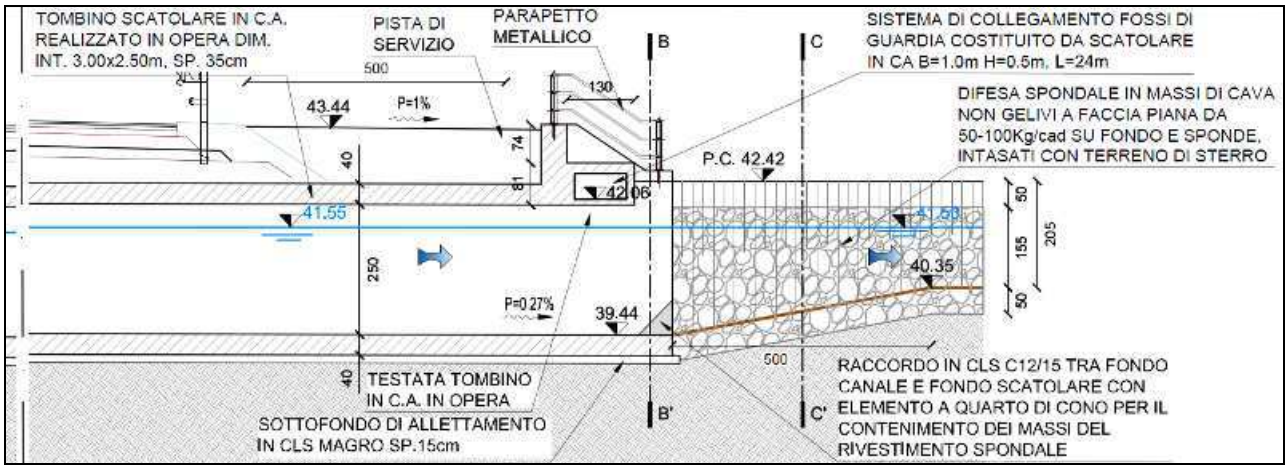


Figura 8-15: Particolare della sezione del sovrappasso idraulico della Fossetta Ballanleoche

Alla PK 02+950 è presente un altro "ostacolo" alla continuità dei fossi di guardia, rappresentato dal sottopasso ciclabile di Via Ferraroni. In questa situazione è stato superato l'"ostacolo" raggirando il sottovia a Nord tramite un tombino scatolare 1.50x1.00cm in CA denominato "TM56", che collega i fossi di guardia come rappresentato nell'immagine seguente.

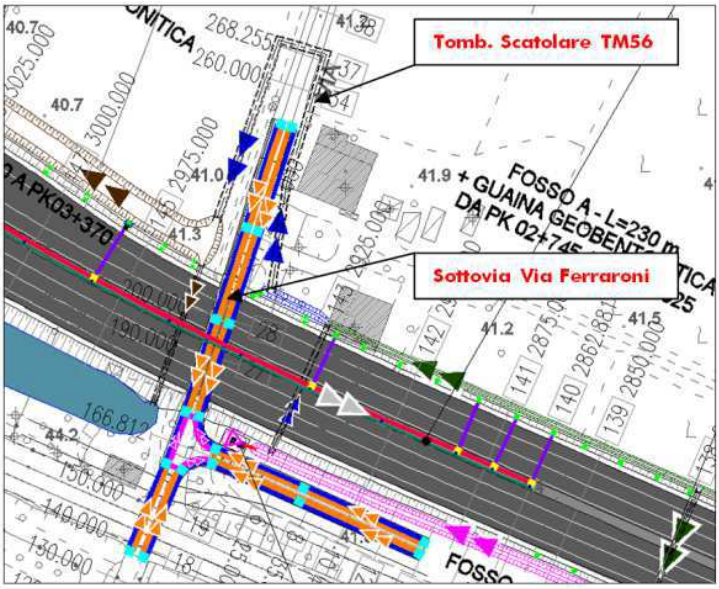


Figura 8-16: stralcio planimetrico del supermanto del sottovia di Via Ferraroni

Dall'invaso le acque sono convolgite tramite il fosso di guardia all'impianto di depurazione denominato "ID03", che, una volta trattate, le scarica con una portata massima di 20l/s nella Fossetta Valle Pieve Modolena, con un limite udometrico di scarico pari a 4.0l/(s*ha), minore di quello imposto dal Consorzio di Bonifica, pari a 8.0l/(s*ha), per una superficie di scolo totale di circa 5.0ha.

Fino alla Pk 02+675.00 il tracciato stradale si trova in un'area caratterizzata da un grado di vulnerabilità basso, quindi i fossi ricadenti in tale area non sono dotati di materassino bentonitico, bensì sono realizzati con materiale prevalentemente argilloso in grado di garantire una buona tenuta idraulica. Dopo questa Pk, il grado di vulnerabilità dell'acquifero è elevato, quindi la vasca di laminazione ed i fossi ricadenti in quest'area sono dotati di materassino bentonitico con ricoprimento di 20cm di terreno vegetale.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 30m;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Est.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 12 ore. In tali condizioni e come riportato precedentemente, il volume d'invaso dei fossi tipo F e della vasca di laminazione, garantiscono un volume totale di circa 3230m^3 a fronte di una superficie impermeabile 3.70ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m^3/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

8.2.1.5. Fossetta Valle Pieve Modolena Ovest

Il tratto sotteso dallo scarico nella Fossetta Valle Pieve Modolena Ovest è compreso tra la Pk 03+193.00 e la Pk 03+425.00, si sviluppa interamente in curva e comprende, oltre all'apporto idrico del rilevato della tangenziale, anche di una quota parte di quello del viadotto Casa Gallinari e delle Rampe 1 e 2 dello svincolo di "Pieve Modolena".

I fossi di guardia previsti sono tutti di tipo B, che scaricano le acque da trattare nell'invaso di laminazione denominata "INV_03" di volume pari a 1800m^3, a valle del quale è presente l'impianto di depurazione denominata "ID_04". Una volta trattate, le acque sono scaricate con una portata massima di 16l/s nella Fossetta Valle Pieve Modolena, rispettando il limite udometrico di scarico imposto dal Consorzio di Bonifica pari a 8.0l/(s*ha) per una superficie di scolo totale di circa 2.0ha.

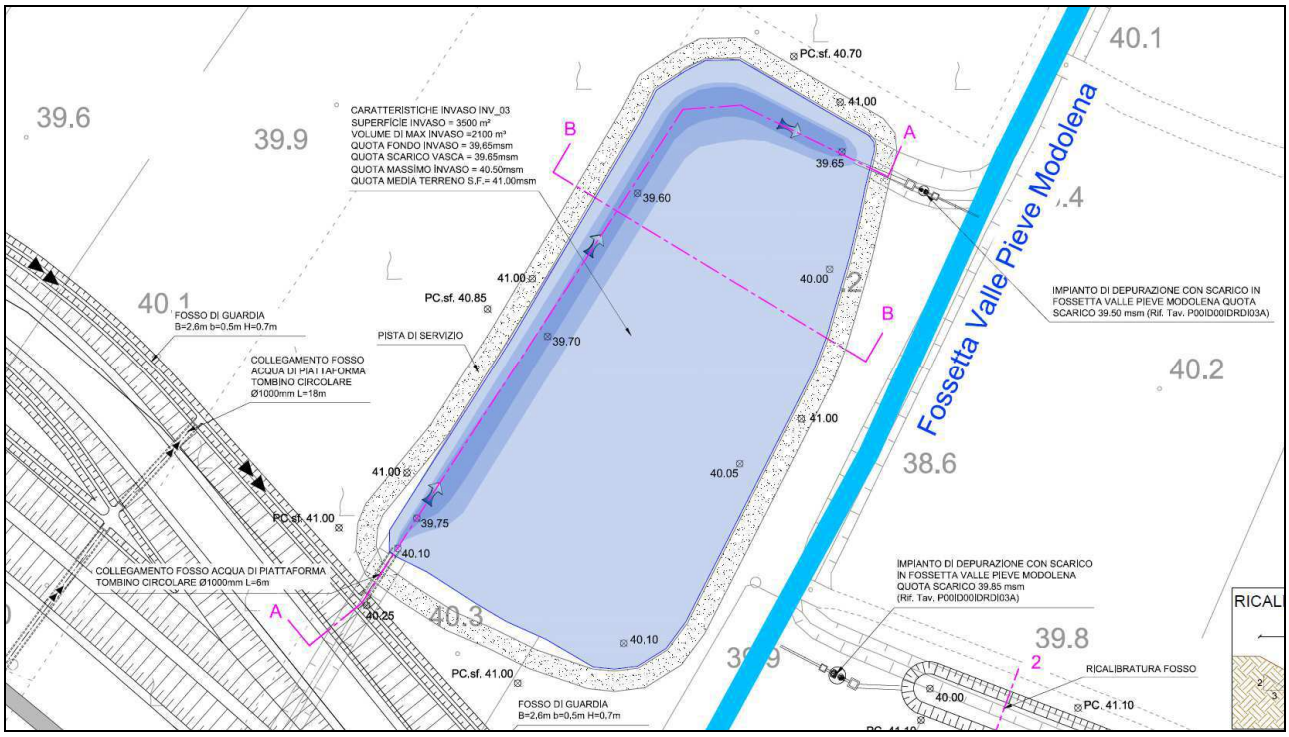


Figura 8-17: Invaso di laminazione INV_03

L'intero tratto stradale considerato ricade in un'area caratterizzata da un grado di vulnerabilità dell'acquifero medio-alto, quindi i fossi di guardia e la vasca di laminazione sono dotati del materassino bentonitico con ricoprimento di 20cm di terreno vegetale.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 30m;
- la larghezza delle rampe pari a circa 10m;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Ovest.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 12 ore. In tali condizioni il solo invaso di laminazione, senza considerare il contributo laminativo dei fossi di guardia, garantisce un volume d'invaso di 1800m^3 a fronte di una superficie impermeabile ci circa 1.0ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

8.2.1.6. Fossetta Valle Roncocesi Est

Il tratto sotteso dallo scarico nella Fossetta Valle Pieve Modolena est è compreso tra la Pk 03+425.00 e la Pk 03+712.00, si sviluppa interamente in curva e comprende, oltre all'apporto idrico del rilevato della tangenziale, anche di una quota parte di quello del viadotto Casa Gallinari e delle Rampe 3 e 4 dello svincolo di "Pieve Modolena".

I fossi di guardia previsti sono di tipo C e D, i quali scaricano le acque da trattare a nord della tangenziale, all'interno dell'impianto di depurazione denominato"ID_05" posto in prossimita del sottopasso poderale Roncocesi.

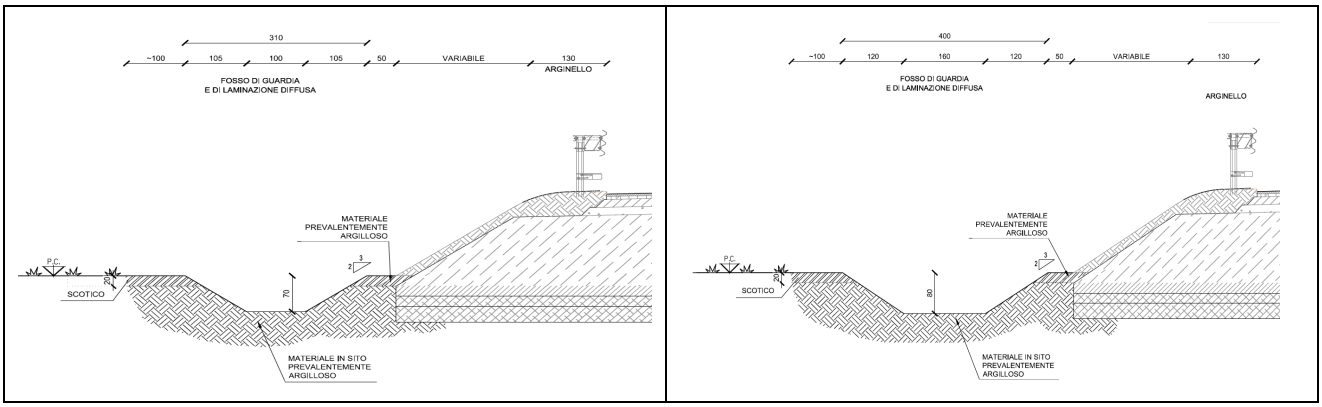


Figura 8-18: Fosso tipo C e Fosso tipo D

Una volta trattate, le acque sono scaricate con una portata massima di 20l/s nella Fossetta Valle Roncocesi, rispettando il limite udometrico di scarico imposto dal Consorzio di Bonifica pari a 8.0l/(s*ha) per una superficie di scolo totale di circa 2.50ha.

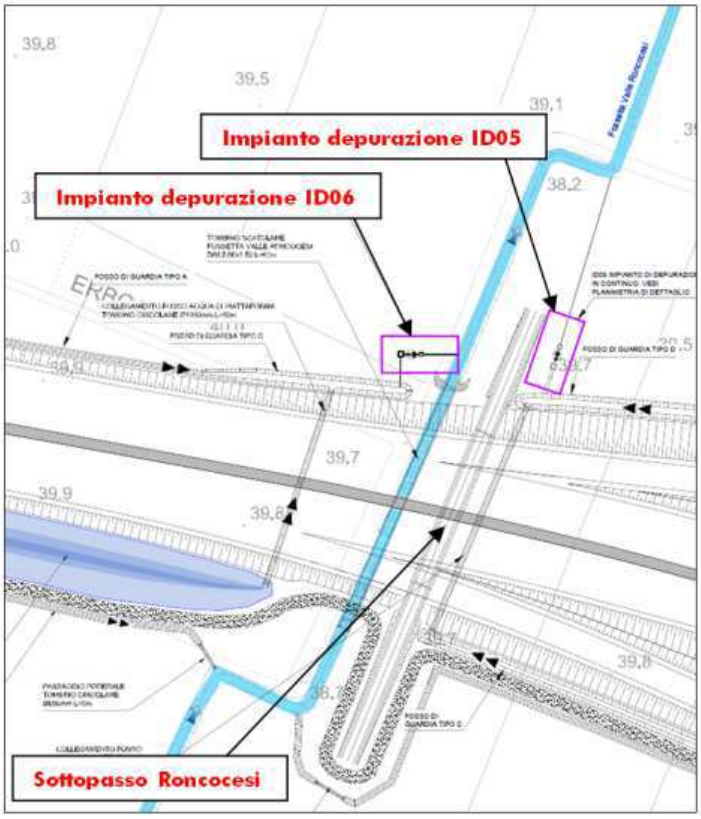


Figura 8-19: stralcio planimetrico dell'impianto di depurazione ID_05 e del sottopasso Roncocesi

L'intero tratto stradale considerato ricade in un'area caratterizzata da un grado di vulnerabilità dell'acquifero medio-alto, quindi i fossi di guardia sono dotati del materassino bentonitico con ricoprimento di 20cm di terreno vegetale.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 30m;
- la larghezza delle rampe pari a circa 10m;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Ovest.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 12 ore. In tali condizioni l'effetto laminativo dei fossi di guardia garantiscono un volume d'invaso di 1130m^3 a fronte di una superficie impermeabile di circa 1.3ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI

COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

A sud della tangenziale tra la Pk 03+425 e la Pk 03+550, è previsto un fosso di guardia tipo A collegato tramite tombino poderale Ø500 in CA ad un fosso di collegamento idraulico di tipo 1, base maggiore di 1,50m, base minore di 0,50m ed altezza di 0,50m, che si sviluppa parallelamente alla tangenziale fino alla Pk 03+725 dove avviene lo scarico diretto nella Fossetta Valle Roncocesi. Questi fossi, posti a circa 5,0m dal ciglio esterno del fosso di guardia stradale, assolvono la funzione di scolo delle acque che cadono sui campi posti tra la ferrovia MI-BO e la tangenziale, la cui morfologia deprime verso Nord-Ovest.

8.2.1.7. Fossetta valle Roncocesi Ovest

Il tratto sotteso dallo scarico nella Fossetta Valle Roncocesi Ovest è compreso tra la Pk 03+712.00 e la Pk 04+375.00 e si sviluppa parte in rettilineo e parte in curva. Tale tratto comprende, oltre all'apporto idrico del rilevato della tangenziale, anche di quello del sottovia Via C. Marx.

I fossi di guardia previsti sono di tipo A, B e D, i quali scaricano le acque da trattare nell'invaso di laminazione denominata "INV_04" di volume pari a 1600m³, a valle del quale è presente l'impianto di depurazione denominata "ID_06" riportato nell'immagine precedente. Una volta trattate, le acque sono scaricate con una portata massima di 30l/s nella Fossetta Valle Roncocesi, rispettando il limite udometrico di scarico imposto dal Consorzio di Bonifica pari a 8.0l/(s*ha) per una superficie di scolo totale di circa 3.75ha.

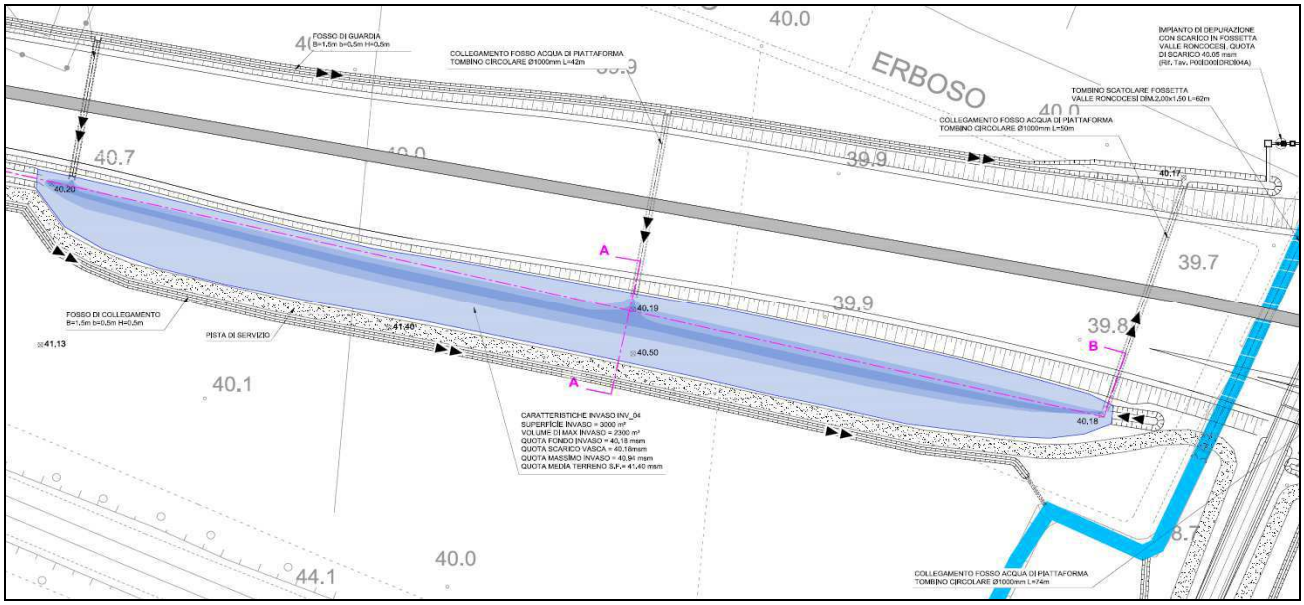


Figura 8-20: Invaso di laminazione INV_04

Il tratto stradale considerato ricade per la maggior parte, in un'area caratterizzata da un grado di vulnerabilità dell'acquifero medio-alto, quindi la vasca di laminazione ed i soli fossi di guardia che raccolgono le acque da

trattare sono dotati del materassino bentonitico con ricoprimento di 20cm di terreno vegetale.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza variabile dai 27m ai 15m, poiché si passa da categoria stradale B a C1;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Ovest.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 6 ore. In tali condizioni il solo invaso di laminazione, senza considerare il contributo laminativo dei fossi di guardia, garantisce un volume d'invaso di 1600m^3 a fronte di una superficie impermeabile di circa 2.0ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

A sud della tangenziale tra la Pk 03+750 e la Pk 04+125, è previsto un fosso di collegamento idraulico di tipo 1, base maggiore di 1,50m, base minore di 0,50m ed altezza di 0,50m, che si sviluppa parallelamente alla tangenziale fino allo scarico diretto nella Fossetta Valle Roncocesi. Questo fosso, posto a circa 5,0m dal ciglio esterno del fosso di guardia stradale, assolve la funzione di scolo delle acque che cadono sui campi posti tra la ferrovia MI-BO e la tangenziale, la cui morfologia deprime verso Nord-Ovest.

8.2.1.8. Torrente Modolena

Il tratto sotteso dallo scarico nel Torrente Modolena è compreso tra la Pk 04+375.00 e la Pk 04+525.000, si sviluppa interamente in rettilineo ed è delimitato dal sottovia di C. Marx e dal Ponte sul Torrente Modolena. Il rilevato in esame è caratterizzato dall'assenza di scarpate in terra, poiché, sono previsti muri di contenimento del rilevato stradale sia in carreggiata nord che sud. Questi sono stati previsti al posto del rilevato in terra allo scopo di limitare l'ingombro dell'infrastruttura stradale che ricade a breve distanza sia dalla ferrovia MI-BO che da un edificio residenziale.

Lo scarico delle acque avviene, per un breve tratto lato nord tra la Pk 04+395.00 e la Pk 04+420.00, all'interno di una fosso di tipo A, posto al piede dell'unica scarpata in terra presente nel tratto in esame. Tale fosso è collegato ad un sistema di condotte Ø500 in PVC PN6 che si estendono per l'intero tratto stradale considerato. Queste sono poste alla base del muro, al di sopra del plinto di fondazione, come mostrato nelle immagini seguenti.

Ad un passo ≤ 15m è presente, sempre alla base del muro, un pozzetto in CA prefabbricato 80x80x100cm che collega i tubi del Ø500 e riceve tramite pliviale Ø140 in PVC PN6 le acque cadute sulla piattaforma stradale.

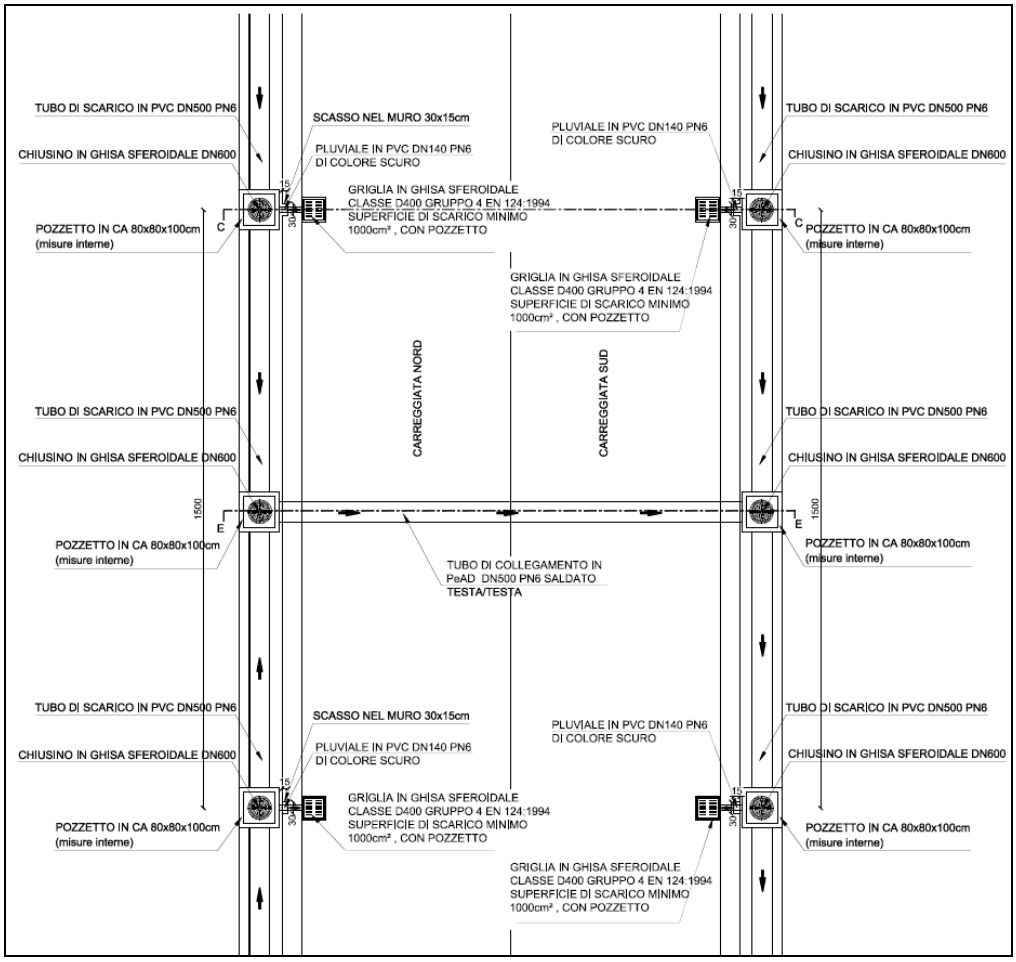


Figura 8-21: Paricolare planimetrico del sistema di collettamento e scarico delle acque di piattaforma nel tratto di strada tra il sottovia di C. Marx e il T. Modolena

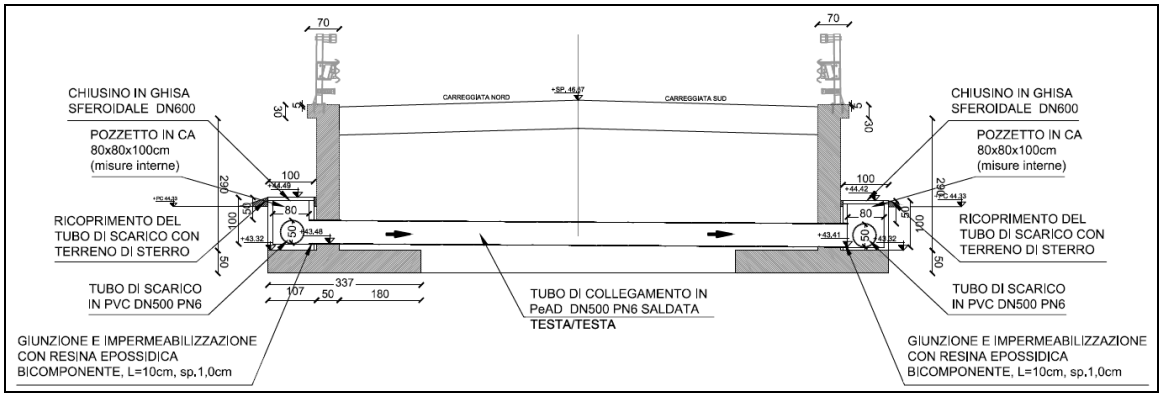


Figura 8-22: Sezione del rilevato stradale in corrispondenza del collegamento tra condotta nord e sud del sistema di collettamento e scarico delle acque di piattaforma nel tratto tra il sottovia di C. Marx e il T. Modolena

Le condotte Ø500 poste alla base del muro in carreggiata nord e sud sono tra loro collegate con una tubazione delle medesime caratteristiche posta alla PK04+455.

Il sistema precedentemente descritto consente di collettare le acque della piattaforma stradale verso l'impianto di depurazione denominata "ID_11" che, una volta trattate, le scarica con una portata massima di 40l/s nel Torrente Modolena, valore irrisorio considerando la portata bisecolare pari a 93m^3/s, in grado di defluire con un franco di sicurezza nel torrente stesso.

Per limitare l'impatto visivo dei pluviali che scendono dalla sommità stradale fino quasi alla base del muro, sono previsti tali accorgimenti:

- la colorazione dei pluviali dovrà essere scura;
- posizionarli all'interno di scassi di dimensioni 30x15cm, realizzati nel muro di contenimento stradale per limitarne la visibilità e contemporaneamente renderli meno vulnerabili ad eventuali urti o agli agenti attmosferici.

Per limitare l'impatto visivo del muro di contenimento e dei tubi Ø500 che collettano le acque verso l'impianto di depurazione è previsto di ricopreire gli stessi con almeno 50cm di terrono di sterro ed inserire specie arbustive, in grado nel tempo di coprire il muro.

Il tratto stradale considerato ricade interamente in un'area caratterizzata da un grado di vulnerabilità dell'acquifero medio-alto, quindi l'unico fosso di guardia previsto è dotato del materassino bentonitico con ricoprimento di 20cm di terreno vegetale.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 15m;
- gli ietogrammi di pioggia relativi alla parte Ovest.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 30 minuti. In tali condizioni il fosso di guardia ed il sistema di condotte del Ø500 previsti, garantiscono un volume di laminazione di circa 80m^3 a fronte di una superficie impermeabile 0.15ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m^3/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

8.2.1.9. Torrente Quaresimo

Il tratto sotteso dallo scarico nel Torrente Quaresimo è compreso tra la Pk 04+525.00 e la Pk 05+210.00 e si sviluppa parte in rettilineo e parte in curva. Tale tratto comprende, oltre all'apporto idrico del rilevato della tangenziale, anche di quello del ponte sul Torrente Modolena e del ponte sul Torrente Quaresimo.

I fossi di guardia previsti sono di tipo A, B, D e F, i quali scaricano le acque da trattare nell'invaso di laminazione denominata "INV_05" di volume pari a 1035m³, a valle del quale è presente l'impianto di depurazione denominata "ID_07". Questo è in grado di trattare una portata massima di 10l/s che viene scaricata tramite l'impianto di sollevamento denominato "IS04", nel corso d'acqua arginato.

La portata massima scaricata nel Quaresimo presenta un limite udometrico pari a circa 4.0l/(s*ha), minore di quello imposto dal Consorzio di Bonifica, pari a 20l/(s*ha), per una superficie di scolo totale di circa 2.6ha.

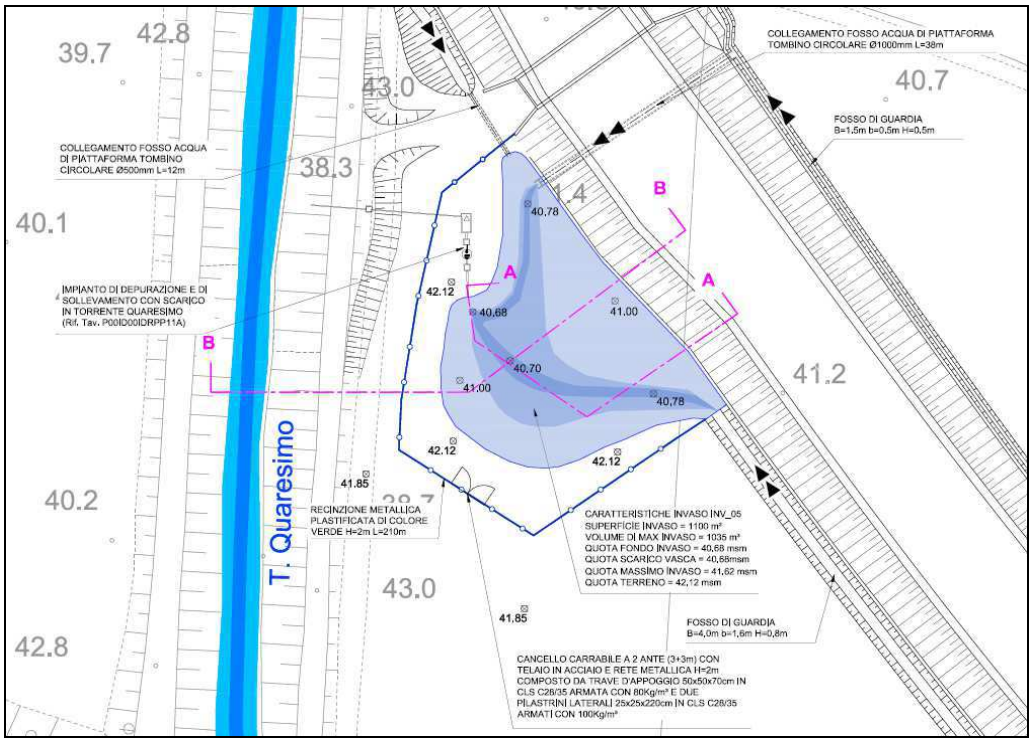


Figura 8-23: Invaso di laminazione INV_05

Alla Pk 05+123.00 è previsto l'inserimento di un sottopasso poderale a raso progettato per consentire il passaggio sotto alla tangenziale e consentire di effettuare agevolmente la manutenzione della sponda destra del Quaresimo a monte e a velle del ponte. La presenza di tale sottopasso e quindi della pista di passagio ha reso nacessario dare continuità ai fossi di guardia con un tubo Ø500 in CA in carreggiata Sud, mentre in carreggiata Nord, dove il fosso è di tipo A, quindi profondo solo 50cm, è previsto un tubo Ø250, sempre in CA.

Il tratto stradale considerato ricade interamente in un'area caratterizzata da un grado di vulnerabilità dell'acquifero medio-alto ed alto, quindi la vasca di laminazione ed i fossi di guardia previsti sono dotato del materassino bentonitico con ricoprimento di 20cm di terreno vegetale.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di circa 15m;
- le scarpate del rilevato con pendenza 2/3;

- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Ovest.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 24 ore. In tali condizioni il solo invaso di laminazione, senza considerare il contributo laminativo dei fossi di guardia, garantisce un volume d'invaso di 1035m^3 a fronte di una superficie impermeabile di circa 1.2ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

8.2.1.10. Fossetta della Torretta Est

Il tratto sotteso dallo scarico nella Fossetta della Torretta Est è compreso tra la Pk 05+210.00 e la Pk 05+462.00e si sviluppa interamente in curva.

I fossi di guardia previsti sono di tipo A e B in carreggiata esterna, quella sud, e tipo D in curva interna, entrambi collettano le acque da trattare nell'impianto di depurazione denominata "ID08". Questo è in grado di trattare una portata massima di 10l/s che viene scaricata tramite l'impianto di sollevamento denominato "IS05", nel corso d'acqua arginato. La portata massima scaricata nella Torretta in sponda destra, rispetta il limite udometrico di scarico imposto dal Consorzio di Bonifica pari a 8.0l/(s*ha), per una superficie di scolo totale di circa 1.25ha.

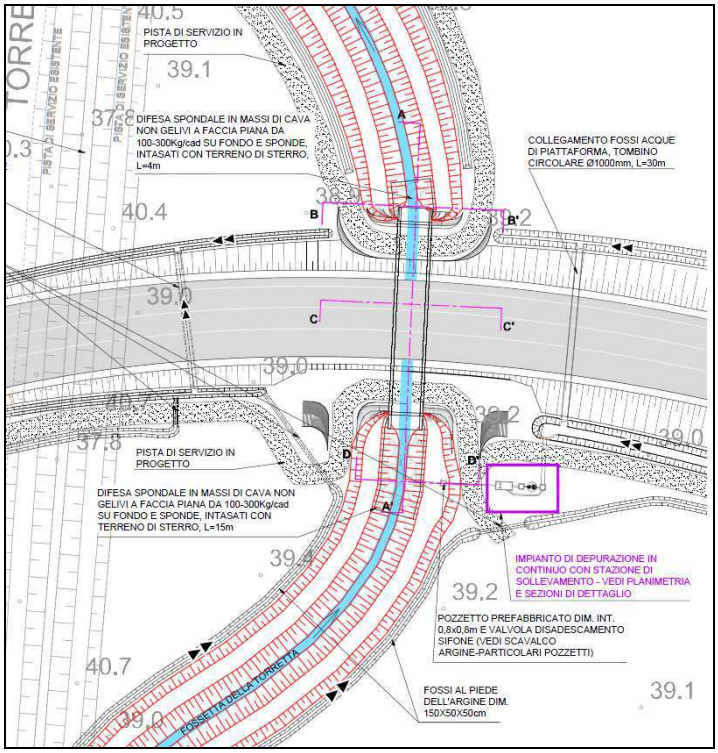


Figura 8-24: particolare planimetrico dello scrico nella Fossetta della Torretta (sponda destra)

Alla Pk 05+250.00 è previsto l'inserimento di un sottopasso poderale a raso progettato per consentire il passaggio sotto alla tangenziale e consentire di effettuare agevolmente la manutenzione della sponda sinistra del Quaresimo a monte e a velle del ponte. La presenza di tale sottopasso e quindi della pista di passagio ha reso nacessario dare continuità ai fossi di guardia con un tubo Ø500 in CA in carreggiata Sud, mentre in carreggiata Nord, dove il fosso è di tipo A, quindi profondo solo 50cm, è previsto un tubo Ø250, sempre in CA.

Il tratto stradale considerato ricade in un'area caratterizzata da un grado di vulnerabilità dell'acquifero medio-alto fino alla Pk 05+375.00, quindi il fosso interno curva, fino a questa progressiva, è dotato del materassino bentonitico con ricoprimento di 20cm di terreno vegetale. Superato il Km 05+375.00 la vulnerabilità dell'acquifero è bassa quindi l'ultimo tratto del fosso interno curva e tutti i fossi esterno curva non sono dotati del materassino bentonitico, bensì sono realizzati con materiale prevalentemente argilloso in grado di garantire una buona tenuta idraulica.

La verifica è stata eseguita considerando:

- la piattaforma stradale con larghezza di 20m;
- le scarpate del rilevato con pendenza 2/3;
- un'area di scolo dei campi di larghezza 5m;
- gli ietogrammi di pioggia relativi alla parte Ovest.

Dalle analisi condotte risulta che la durata critica della precipitazione per il tratto di strada analizzato e per TR=50anni è pari a 6 ore. In tali condizioni l'effetto laminativo dei fossi di guardia, garantiscono un volume d'invaso di circa 540m^3 a fronte di una superficie impermeabile di circa 0.43ha$_{imp,}$ quindi superiore al minimo richiesto pari a 500m³/ha$_{imp}$.

Nell' ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO sono riportati i risultati relativi alla configurazione appena descritta.

A sud della tangenziale, per l'intero tratto stradale considerato, sono previsti due fossi di collegamento idraulico di tipo 1, base maggiore di 1,50m, base minore di 0,50m ed altezza di 0,50m, che si sviluppano parallelamente alla tangenziale fino allo scarico diretto nel Fosso 4. Questo fossi di collegamento, posti a circa 5,0m dal ciglio esterno del fosso di guardia stradale, assolvono la funzione di scolo delle acque che cadono sui campi posti tra la ferrovia MI-BO e la tangenziale, la cui morfologia deprime verso Nord.

8.2.1.11. Fossetta della Torretta Ovest

Il tratto sotteso dallo scarico nella Fossetta della Torretta Ovest è compreso tra la Pk 05+462.00 e la Pk 06+200.00 e si sviluppa interamente in curva inoltre, questo tratto di strada è prevalentemente in trincea dovendo sottopassare la linea ferroviaria MI-BO.

La trattazione del dimensionamento dei collettori nella trincea viene argomentato nel capitolo 8.2.7, mentre di seguito si affronta la gestione delle acque di piattaforma concentrandosi sui fossi di guardia e sullo scarico nel corpo idrico recettore.

I fossi di guardia previsti sono tutti di tipo A e costeggiano la tangenziale dalla Pk 05+462.00 fino alla connessione con Via G. Vico cioè al termine del tracciato in progetto. Questi fossi hanno principalmente la funzione di scolare le acque dei campi e quindi di proteggere la trincea da eventuali allagamenti delle aree coltive circostanti. Questa loro peculiarità consente di evitare di depurare le acque scolate e di collegarsi direttamente all'attuale rete di scolo esistente, per la quale sono previsti diversi risezionamenti e l'autospurgo di alcuni tombini esistenti al fine di ripristinare la loro officiosità idraulica.

Il tratto di strada tra la Pk 05+462.00 e la Pk 06+200.00 recapita, tramite un sistema di tubi, le acque di piattaforma all'interno di una vasca di accumulo posta sotto alla sede stradale, nel punto più depresso della trincea. Da qui le acque vengono depurate dall'impianto denominato "ID09" in grado di trattare una portata massima di 20l/s che viene pompata dall'impianto di sollevamento denominato "IS06" verso la Fossetta della Torretta dove, mediante scavalco arginale, avviene lo scarico.

La portata massima scaricata nella Torretta in sponda sinistra, pari a 20l/s, costituisce un apporto irrisorio considerando la portata massima sostenibile di un esteso tratta di canale analizzato, pari a 7,5m^3/s.

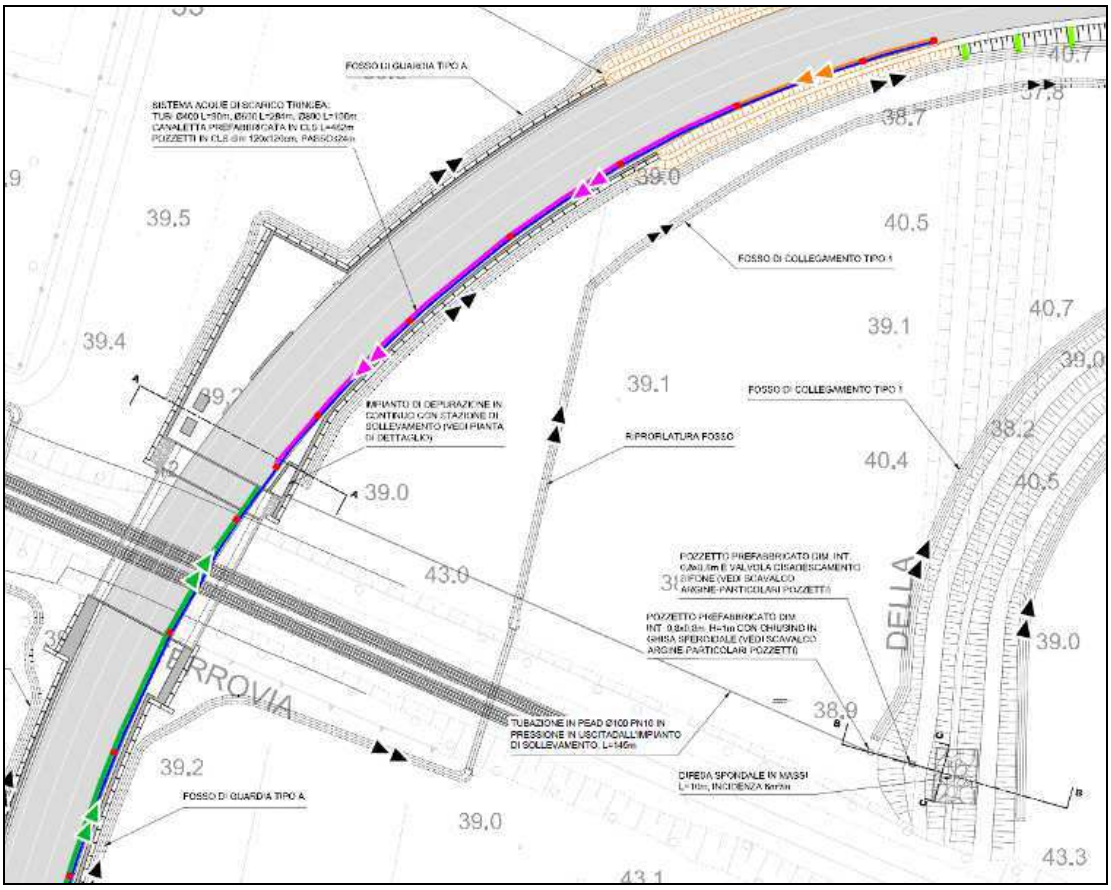


Figura 8-25: particolare planimetrico dello scrico nella Fossetta della Torretta (sponda sinistra)

8.2.2. Idraulica dei collettori di raccolta in curva per strada di categoria B

I collettori di raccolta si presentano in tutti i tratti in curva per strada di categoria B, al fine di drenare le acque provenienti dalla carreggiata esterna.

L'ipotesi progettuale prevede una pendenza minima dei collettori pari allo 0.1% e un grado di riempimento ≤ 70% per piogge con TR100 anni. Gli scarichi avvengono per mezzo di tubazioni in PeAD Ø315mm posizionati al massimo ogni 60m. In questa situazione si distinguono due differenti diametri:

- collettori PeAD Ø400 per pendenze comprese tra lo 0.1% e lo 0.3%;
- collettori PeAD Ø350 per pendenze superiori allo 0.3%.

Il passo degli scarichi nei fossi di guardia è pari a 60m tranne nei tratti con cambio di pendenza e nei punti finali della tubazione di collettamento dove è pari a 10m.

Nell'analisi idraulica, la piattaforma stradale è stata considerata di larghezza pari a 17.50m, di cui 2.50m con pendenza del 10% e i rimanenti 15.00m con pendenza del 7%, e con le caratteristiche definite al paragrafo 7.2.

Dalle analisi condotte risulta che la durata critica è pari a 15' e che i collettori presentano un coefficiente di riempimento ≤ 70% per piogge con TR100 anni e presentano un coefficiente di riempimento ≤ 50% per piogge con TR25 anni (come da Capitolato d'oneri ANAS); di seguito si mostrano i profili di rigurgito e si riportano i risultati nell'ALLEGATO 2: RISULTATI DIMENSIONAMENTO COLLETTORI DI RACCOLTA per i due tipologici di riferimento e per durate di 15' per TR25-100 anni e di 30' per TR100 anni.

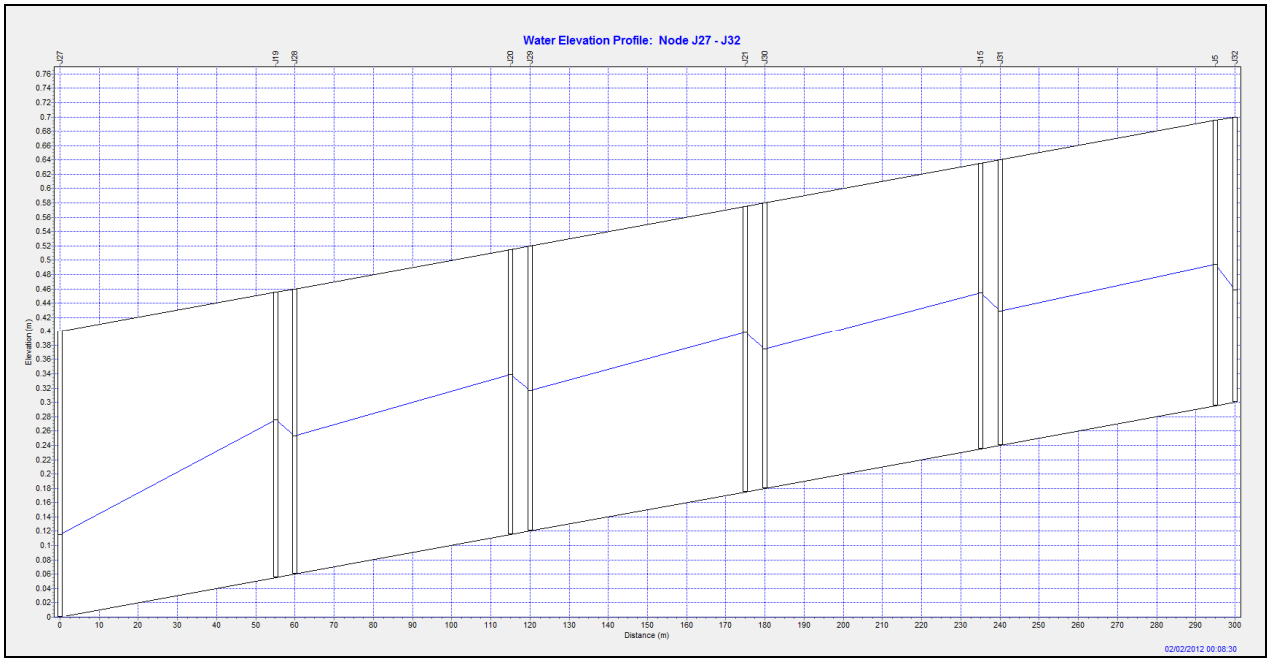


Figura 8-26: Profilo di rigurgito di un tratto di collettore Ø400 con pendenza pari allo 0.1% per TR100 anni e d=15'

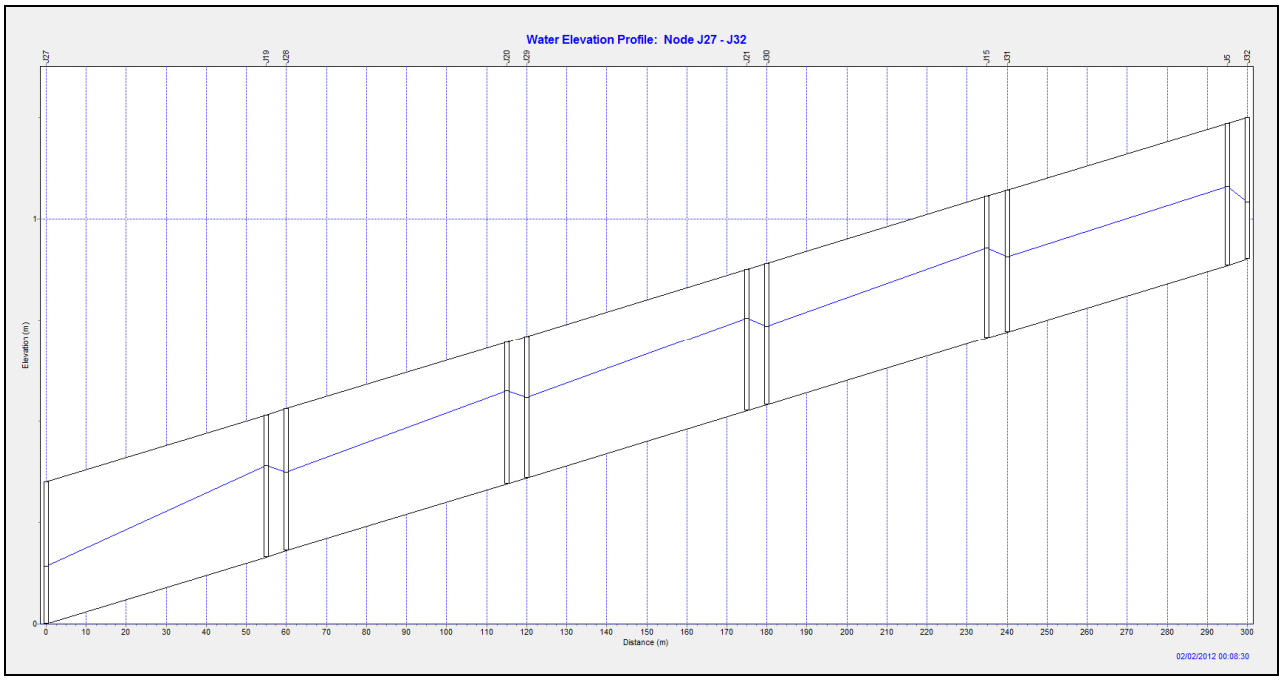


Figura 8-27: Profilo di rigurgito di un tratto di collettore Ø350 con pendenza pari allo 0.3% per TR100anni e d=15'

8.2.3. Idraulica di embrici e canalette in rettifilo

L'analisi idraulica parte dalla definita forma delle canalette stradali (5+5 di base, Figura 8-28) con lo scopo di definire il passo degli embrici di dimensioni 30x10cm. Nella modellazione è stato implementato lo ietogramma corrispondente ad una pioggia con TR25 anni di 35.5mm in 15 minuti con un picco di 17.5mm in 5 minuti (Figura 6-6) verificando, come da Capitolato d'Oneri ANAS che la vena d'acqua defluente in carreggiata a bordo del cordolo sia inferiore ad 1,0m per banchine da 1,75m.

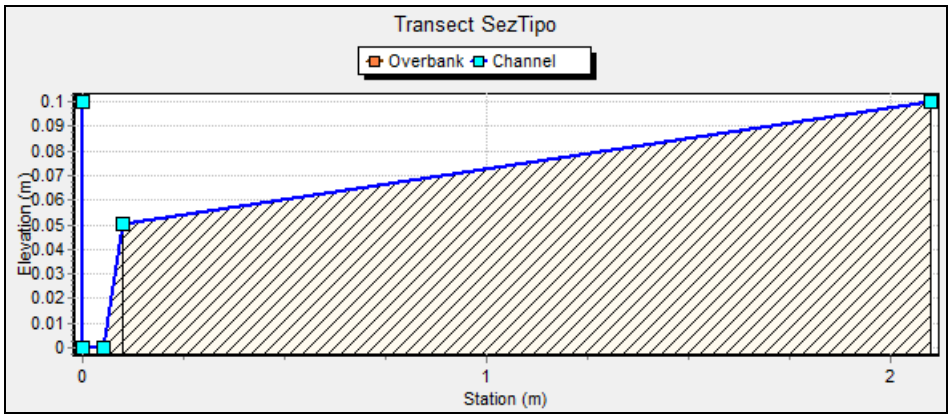


FIGURA 8-28: SEZIONE RICOSTRUITA DELLA CANALETTA STRADALE NEL TRATTO IN RETTIFILO

La piattaforma stradale è stata analizzata idraulicamente considerando una larghezza variabile tra 3.5 e 15 metri a seconda del tipo di strada analizzato e con le caratteristiche definite al paragrafo 7.2.

Si raggiungono i seguenti risultati:

- Strada di categoria B: il passo degli embrici è pari a 10m per pendenze 0,001 ≤ i ≤ 0,008 e pari a 15m per i ≥ 0,008 con un allagamento della banchina di poco inferiore ad 1,0m;
- Strada di categoria C1: il passo degli embrici risulta pari a 20m con un allagamento della banchina pari ad 0,8m;
- Rampe: il passo degli embrici scelto è pari a 20m, anche se risulta verificato con passo da 30m. Questa scelta è stata fatta per adeguarci ai tratti in curva che sono verificati con passo di 20m e rappresentano la stragrande maggioranza dei casi.

Di seguito si mostrano i profili di rigurgito per ciascuna tipologia di strada analizzata. In ALLEGATO 3: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA IN RETTILINEO si riportano i risultati ottenuti.

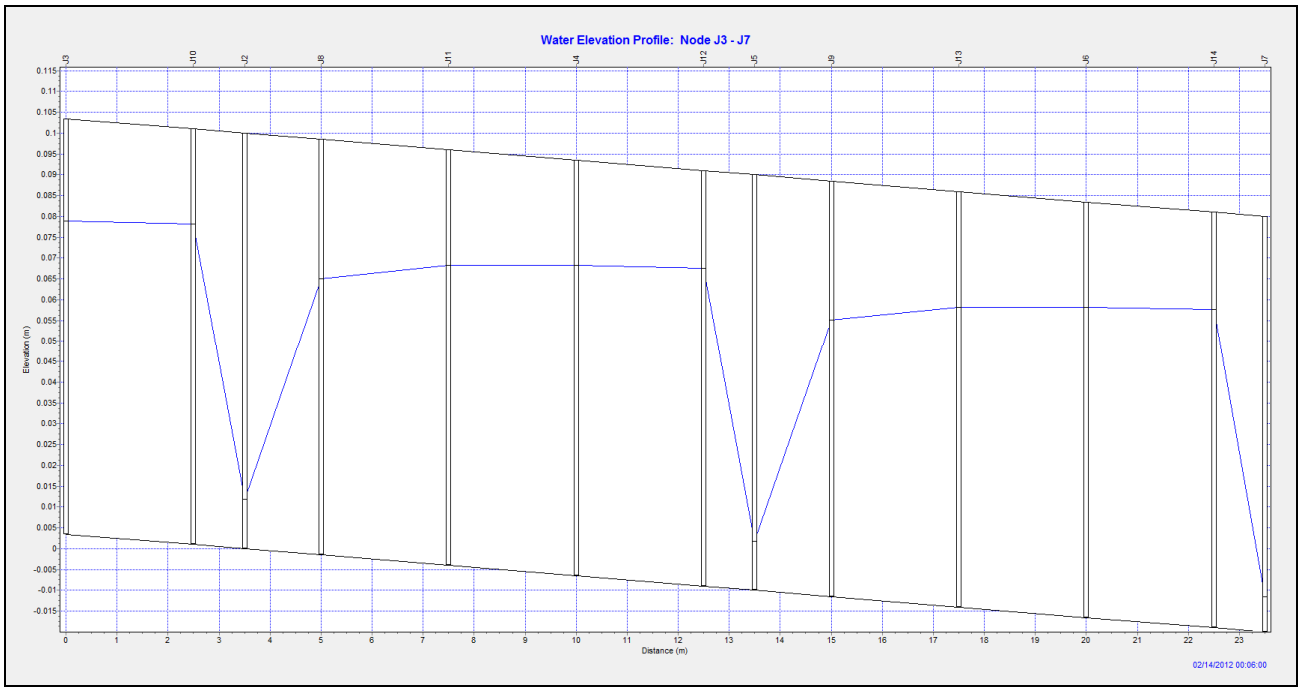


Figura 8-29: Profilo di rigurgito di un tratto di canaletta di strada di categoria B con pendenza pari a 0.001 e passo embrici 10 metri

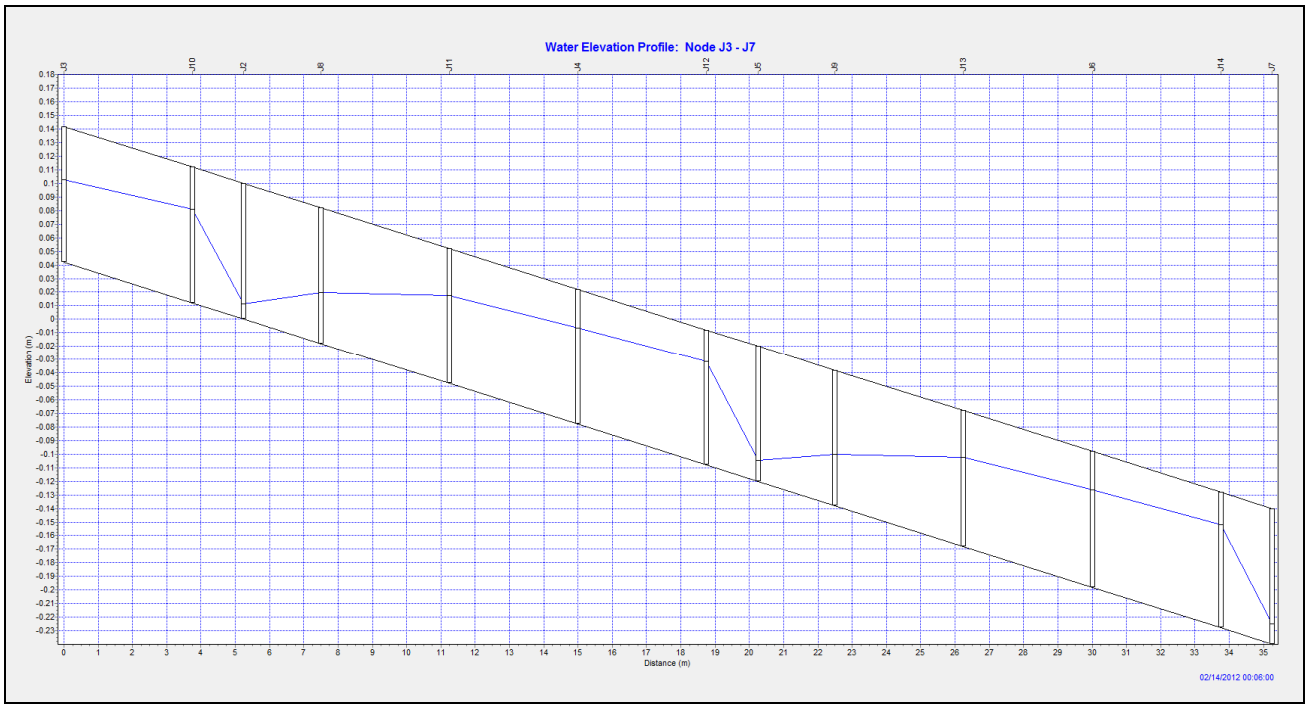


Figura 8-30: Profilo di rigurgito di un tratto di canaletta di strada di categoria B con pendenza pari a 0.008 e passo embrici 15 metri

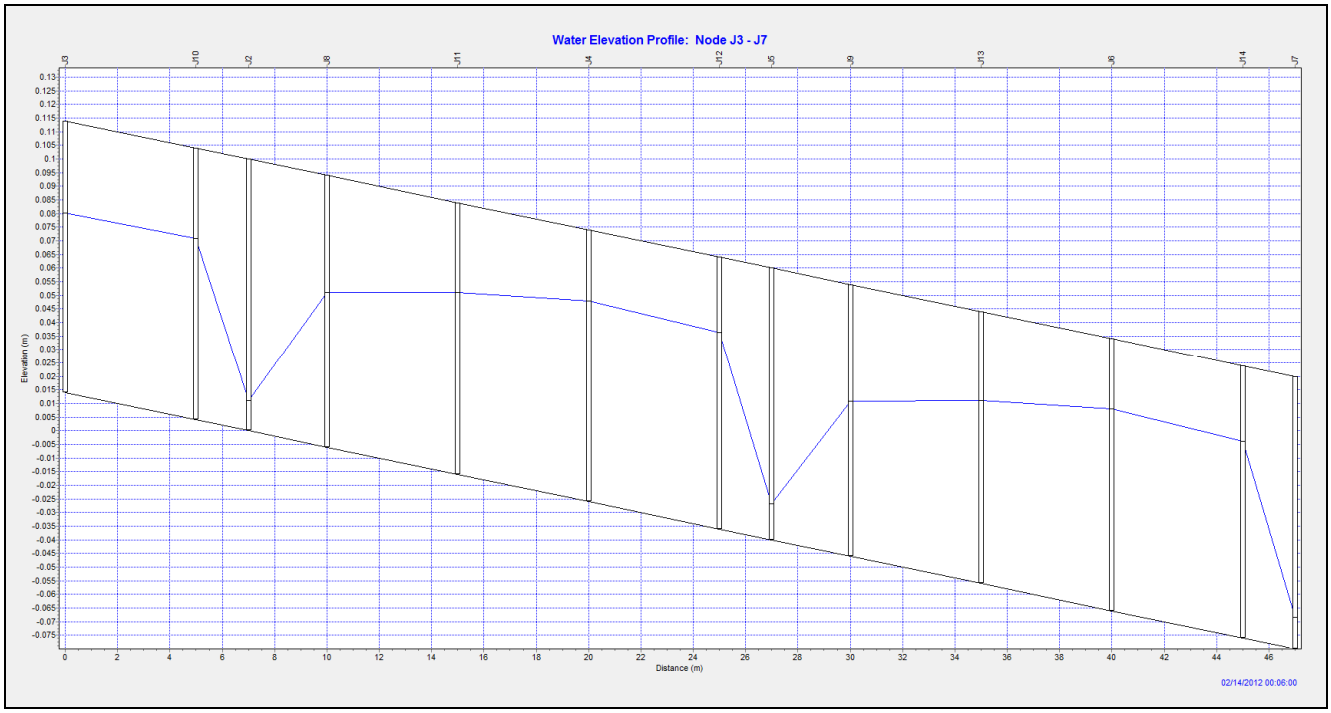


Figura 8-31: Profilo di rigurgito di un tratto di canaletta di strada di categoria C1 con pendenza pari a 0.002 e passo embrici 20 metri

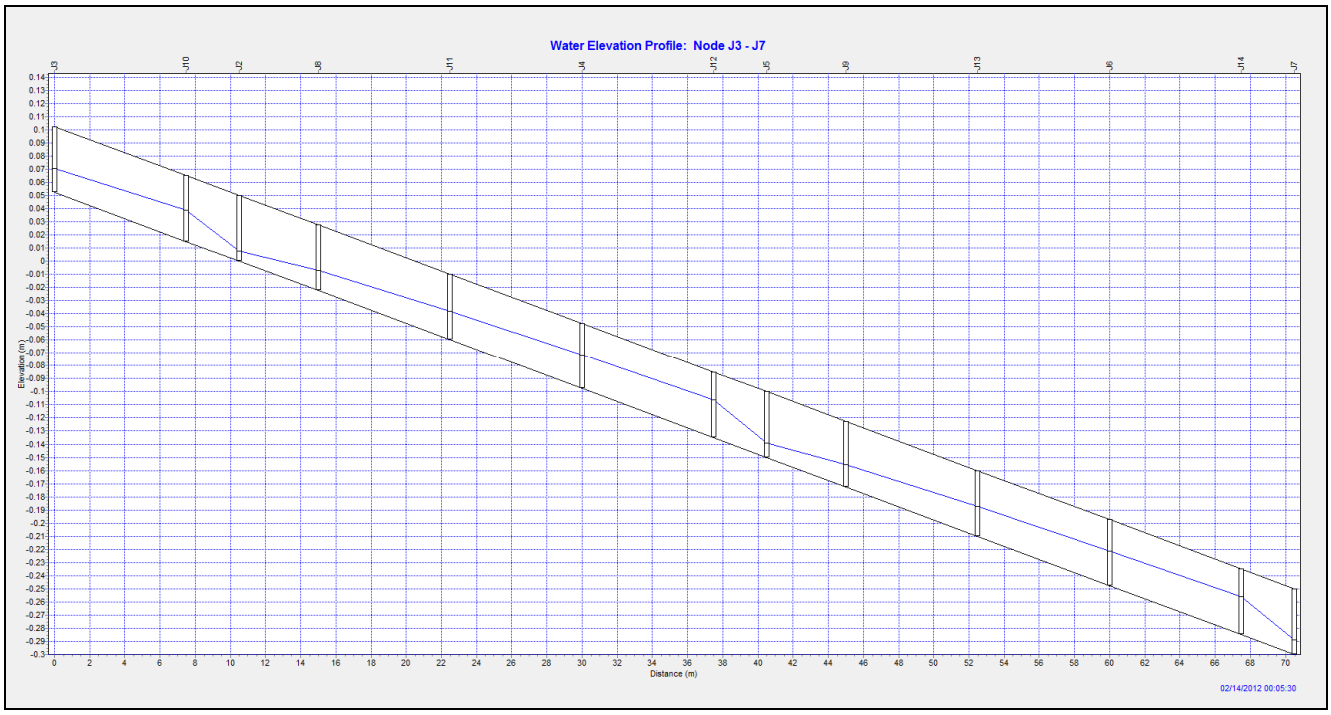


Figura 8-32: Profilo di rigurgito di un tratto di canaletta relativa ad una rampa con pendenza pari a 0.005 e passo embrici 30 metri

8.2.3.1. Tratto di strada tra il Sottovia K.Marx e il Ponte sul Torrente Modolena

L'analisi idraulica parte dalla definita forma delle canalette stradali (5+5 di base, vedi Figura 8-28) con lo scopo di definire il passo dei pozzetti e quindi degli scarichi. Diversamente da quanto previsto negli altri tratti in rilevato, tra il Sottovia di K.Marx e il torrente Modolena, muri di contenimento del rilevato prendono il posto delle scarpate in terra, quindi, le acque, convogliate nella canaletta, sono scaricate mediante pluviali Ø140 in PVC verso la base del muro all'interno di un sistema di condotte Ø500 in PVC come descritto al capitolo 8.2.1.8.

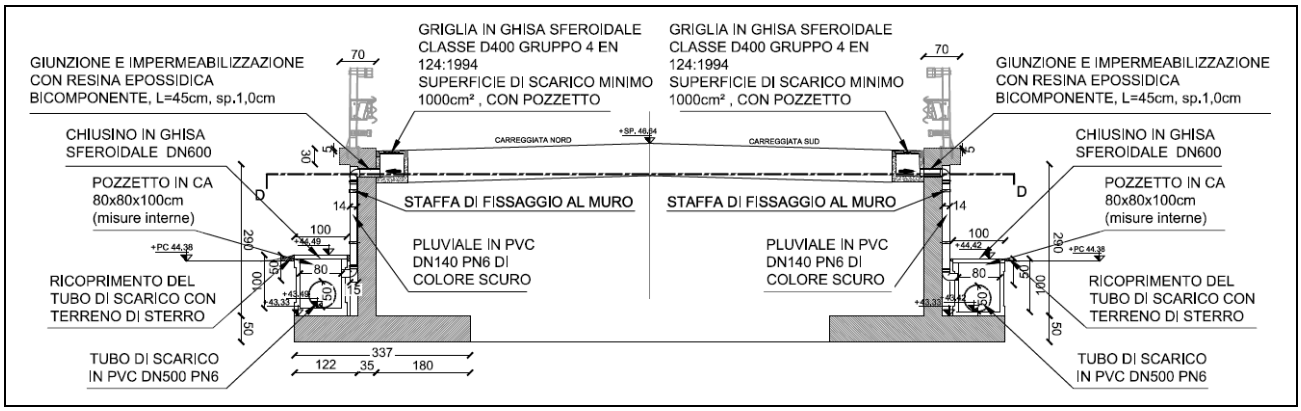


FIGURA 8-33: PARTICOLARE DELLA SEZIONE STRADALE CON SISTEMA DI SCARICO DELLE ACQUE DI PIATTAFORMA

Nella modellazione è stato implementato lo ietogramma corrispondente ad una pioggia con TR25 anni di 35.5mm in 15 minuti con un picco di 17.5mm in 5 minuti (Figura 6-6) verificando, come da Capitolato d'Oneri ANAS che la vena d'acqua defluente in carreggiata a bordo del cordolo sia inferiore ad 1,0m per banchine da 1,75m.

La piattaforma stradale, è stata analizzata idraulicamente considerando una larghezza variabile tra 7.0m e 9.0m e con le caratteristiche definite al paragrafo 7.2.

Il passo dei pozzetti di scarico è pari a 15m, di seguito si mostra il profilo di rigurgito del tratto analizzato. In ALLEGATO 3: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA IN RETTILINEO si riportano i risultati ottenuti.

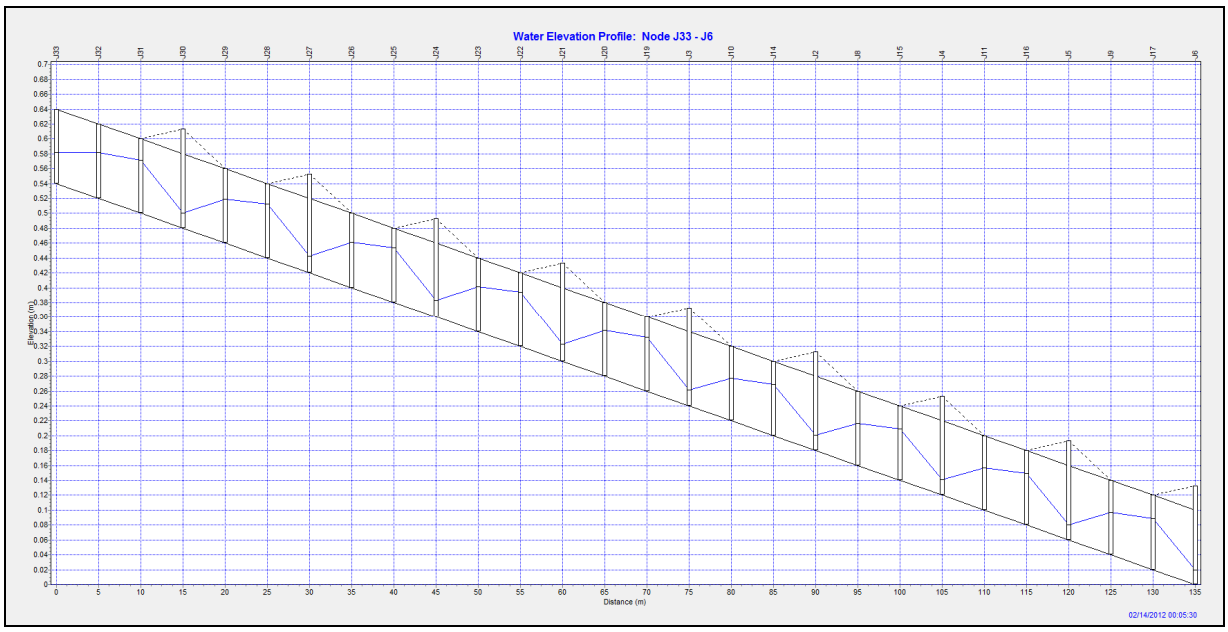


FIGURA 8-34: PROFILO DI RIGURGITO DELLA CANALETTA RELATIVA AD UN TRATTO DI STRADA COMPRESO TRA IL SOTTOVIA K.MARX ED IL TORRENTE MODOLENA, CON PENDENZA PARI A 0.004 E PASSO 15M

8.2.4. Idraulica di embrici e canalette in curva per strada di categoria C1 e per le rampe

L'analisi idraulica parte dalla definita forma delle canalette stradali con lo scopo di definire il passo degli embrici di dimensioni 30x10 cm. Nella modellazione è stato implementato lo ietogramma corrispondente ad una pioggia con TR25 anni di 35.5mm in 15 minuti con un picco di 17.5mm in 5 minuti (Figura 6-6).

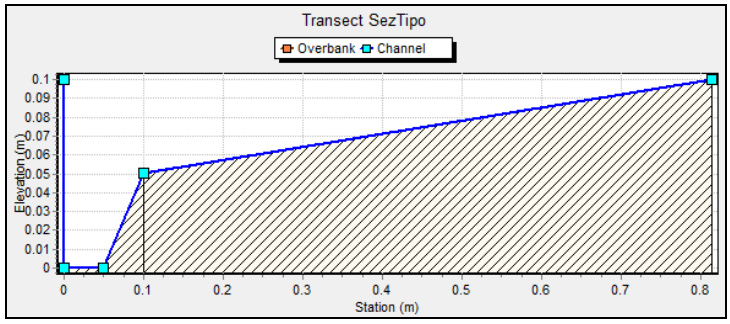


FIGURA 8-35: SEZIONE RICOSTRUITA DELLA CANALETTA STRADALE NEL

TRATTO IN CURVA

La piattaforma stradale è stata analizzata idraulicamente considerando una larghezza pari a 15m per la strada di categoria C1 e 7m per le rampe e con le caratteristiche definite al paragrafo 7.2.

Si raggiungono i seguenti risultati:

- Strada di categoria C1:
  - Se 5% ≤ i_{trasv} ≤ 7% il passo degli embrici risulta pari a 15m per pendenze 0,001 ≤ i ≤ 0,008 e pari a 20m per i ≥ 0,008 con un allagamento della banchina pari ad 0,75m;
  - Se i_{trasv} < 5% il passo degli embrici, come per il caso rettilineo della strada di categoria B, è pari a 10m per pendenze 0,001 ≤ i ≤ 0,008 e pari a 15m per i ≥ 0,008 con un allagamento della banchina di poco inferiore ad 1,0m.
- Rampe: il passo degli embrici è pari a 20m, tranne in casi paricolari in cui è stato necessario infittirlo a 10m, come in prossimità dei sottopassi.

Di seguito si mostrano i profili di rigurgito per ciascuna tipologia di strada analizzata. In ALLEGATO 4: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA IN CURVA si riportano i risultati ottenuti.

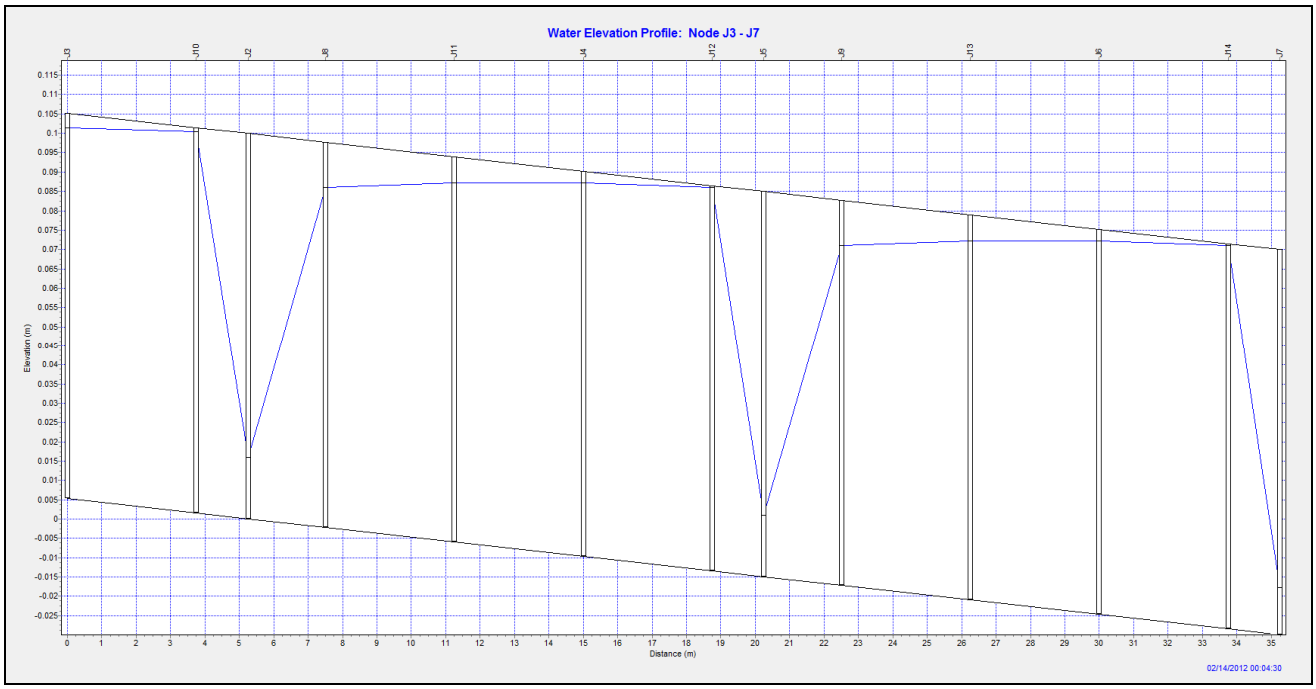


Figura 8-36: Profilo di rigurgito di un tratto di canaletta di strada di categoria C1 con pendenza longitudinale pari a 0.001, pendenza trasversale superiore al 5% e passo embrici 15 metri

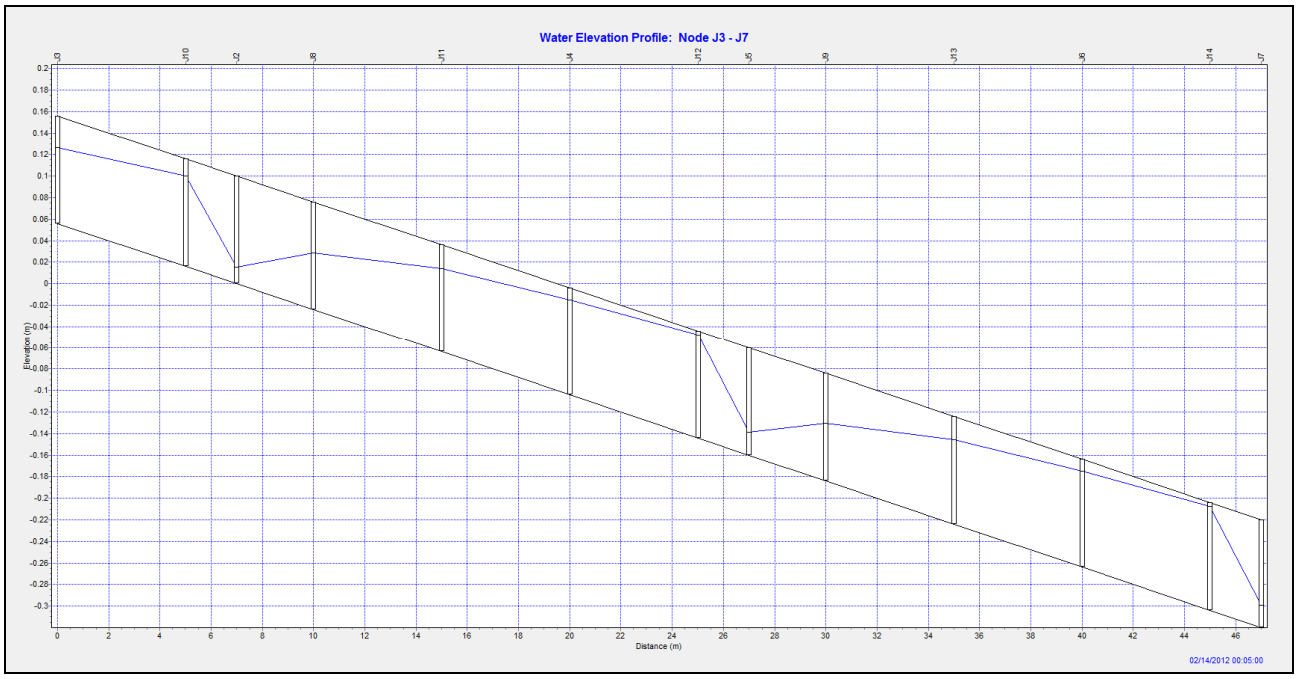


Figura 8-37: Profilo di rigurgito di un tratto di canaletta di strada di categoria C1 con pendenza longitudinale pari a 0.008, pendenza trasversale superiore al 5% e passo embrici 20 metri

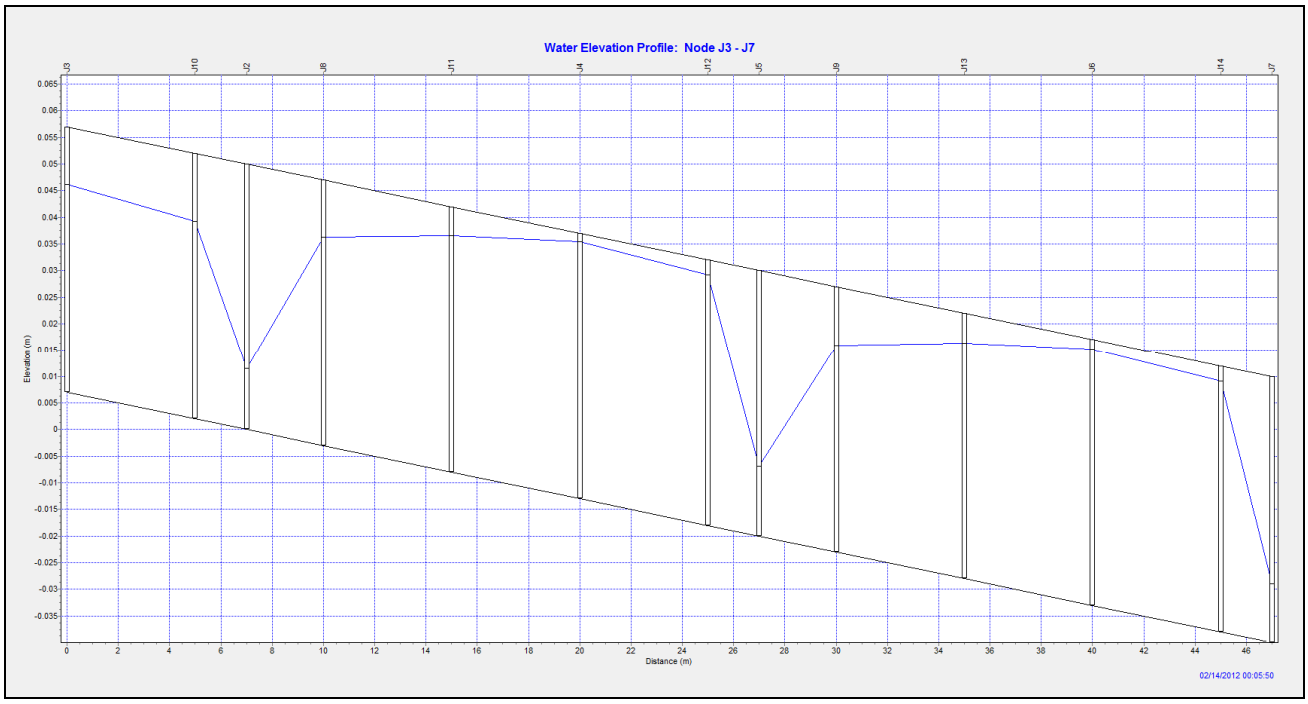


Figura 8-38: Profilo di rigurgito di un tratto di canaletta relativa ad una rampa con pendenza pari a 0.001 e passo embrici 20 metri

8.2.5. Idraulica di embrici, canalette e sistemi di raccolta in curva per strada di categoria B

Nei tratti di strada in curva per la strada di categoria B si è proceduto distinguendo tra carreggiata interna ed esterna della piattaforma stradale sempre implementando lo ietogramma corrispondente ad una pioggia di 35.5mm in 15 minuti con un picco di 17.5mm in 5 minuti (Figura 6-6) e verificando, come da Capitolato d'Oneri ANAS che la vena d'acqua defluente in carreggiata a bordo del cordolo sia inferiore ad 1,0m per banchine da 1,75m.

8.2.5.1. Carreggiata interna

Il metodo è lo stesso seguito per l'analisi del tratto in rettifilo, considerando una larghezza della piattaforma stradale di 12 metri e una pendenza trasversale del 7%.

Il passo degli embrici:

- Se 5% ≤ i_{trasv} ≤ 7% risulta pari a 15m per pendenze 0,001 ≤ i ≤ 0,008 e pari a 20m per i ≥ 0,008 con un allagamento della banchina pari ad 0,75m;
- Se i_{trasv} < 5% il passo degli embrici, come per il caso rettilineo, è pari a 10m per pendenze 0,001 ≤ i ≤ 0,008 e pari a 15m per i ≥ 0,008 con un allagamento della banchina di poco inferiore ad 1,0m.

Di seguito si mostrano i profili di rigurgito dei casi esaminati. In ALLEGATO 4: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA IN CURVA si riportano i risultati ottenuti.

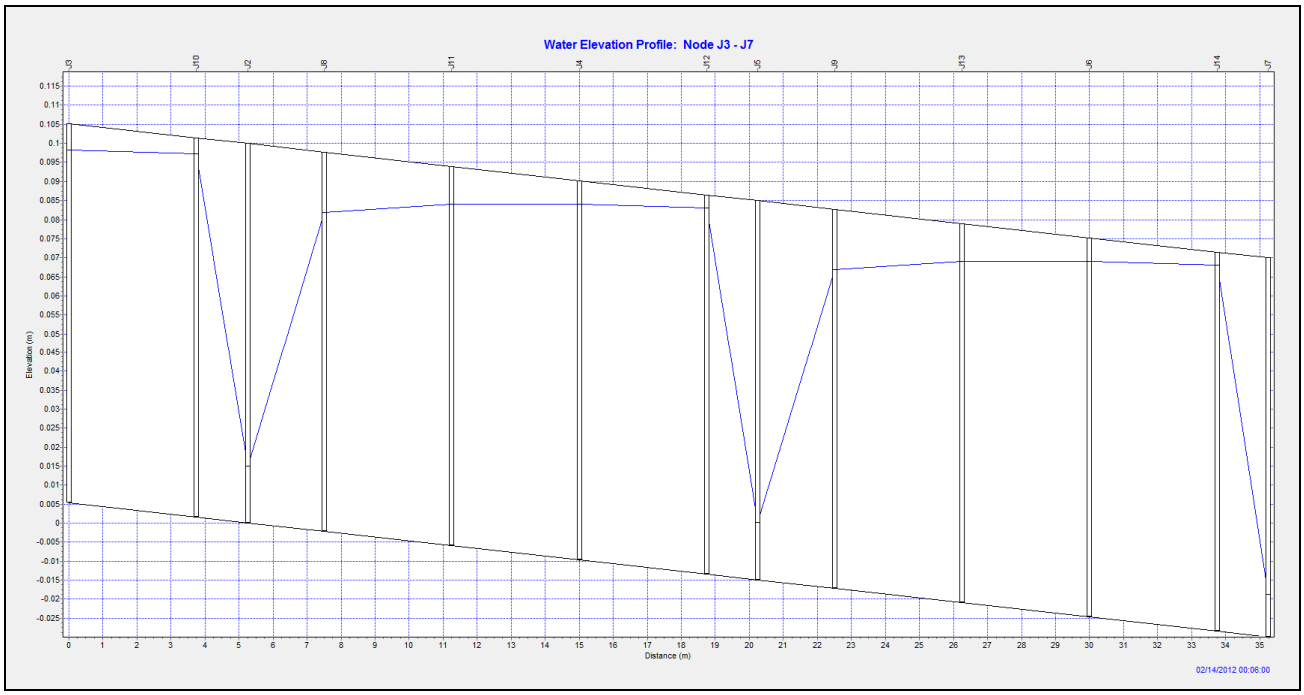


Figura 8-39: Profilo di rigurgito di un tratto di canaletta di strada di categoria B con pendenza longitudinale pari a 0.001, pendenza trasversale superiore al 5% e passo embrici 15 metri

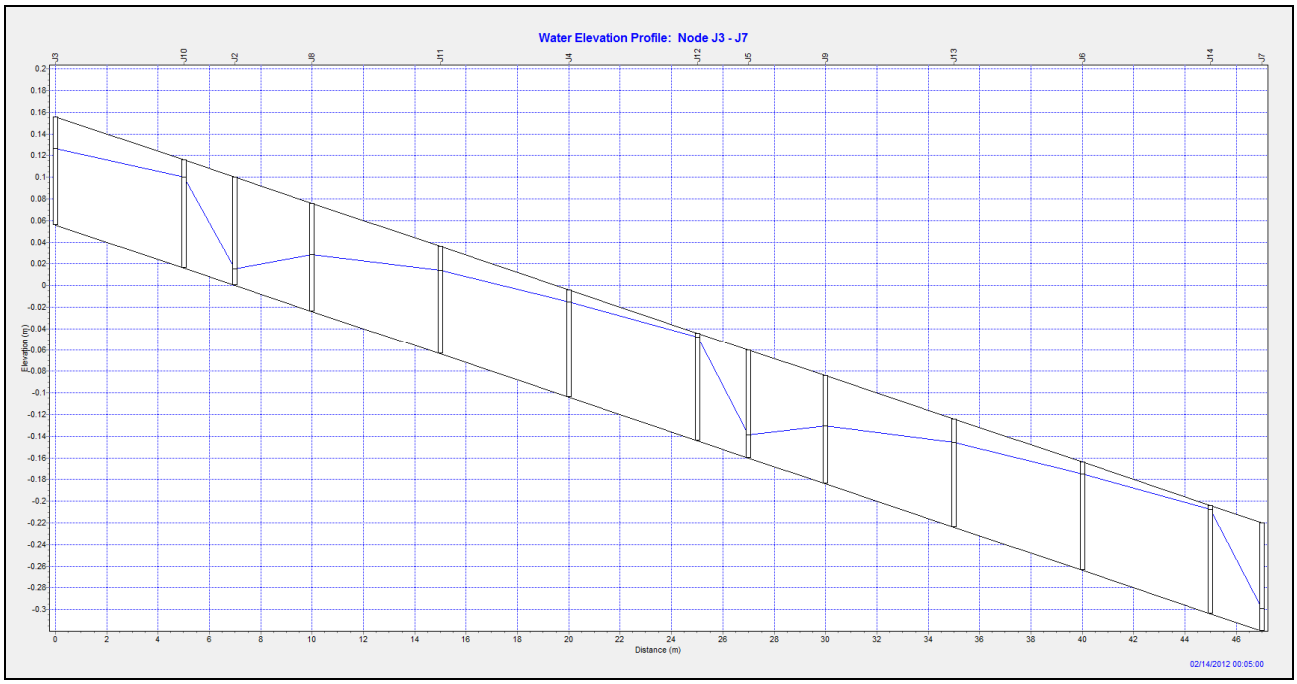


Figura 8-40: Profilo di rigurgito di un tratto di canaletta di strada di categoria B con pendenza longitudinale pari a 0.008, pendenza trasversale superiore al 5% e passo embrici 20 metri

8.2.5.2. Carreggiata esterna

L'analisi idraulica ha lo scopo di definire, una volta nota la geometria dell'elemento di raccolta, il passo degli scarichi nella tubazione ricettrice.

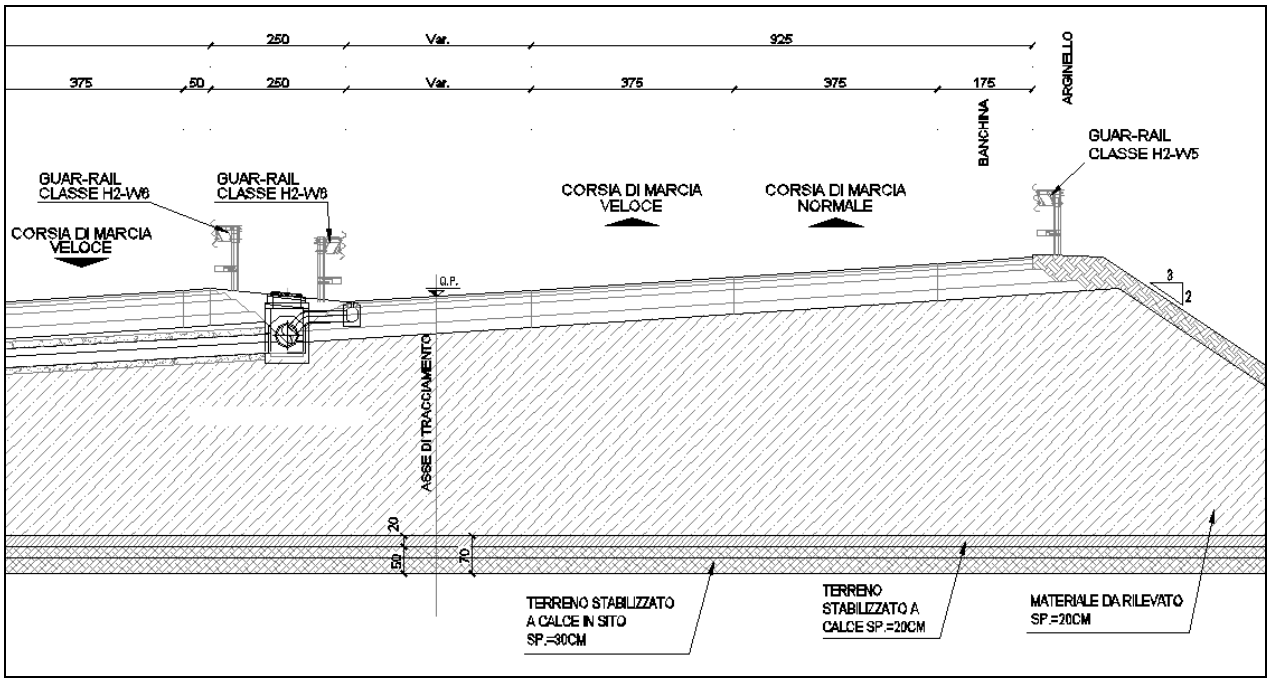
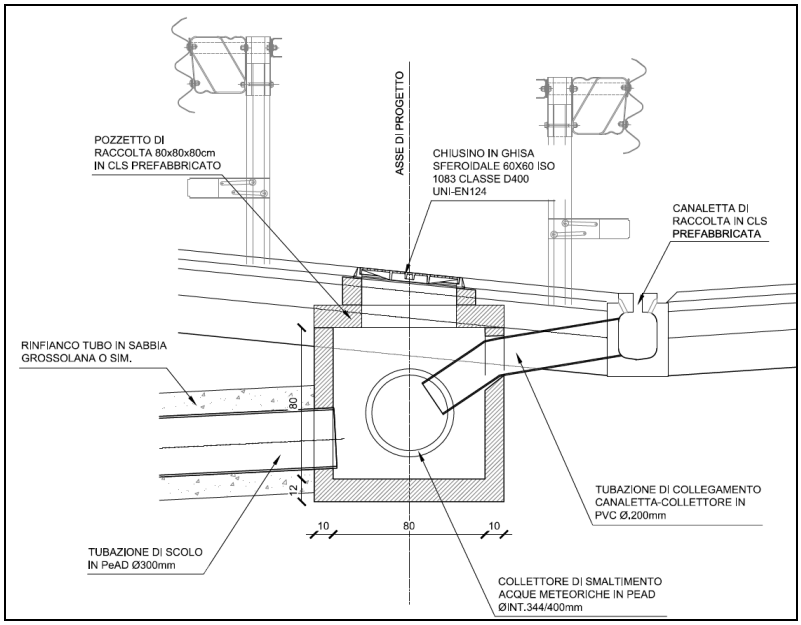


FIGURA 8-41: SEZIONE STRADA DI CATEGORIA B – CARREGGIATA ESTERNA

La piattaforma stradale, illustrata nell'immagine precedente, è stata analizzata idraulicamente considerando una larghezza totale di 17.50m di cui 2.5m con pendenza del 10% e i rimanenti 15.0m con pendenza del 7%, e con le caratteristiche definite al paragrafo 7.2.



Come mostrato a fianco, la canaletta di raccolta è prefabbricata in cls di dimensioni 20x25cm, le tubazioni di scarico sono in PVC Ø200mm. L'obiettivo è quello di garantire un grado di riempimento della canaletta inferiore al 70% in occasione di un evento di pioggia con TR100 anni. Il passo delle tubazioni di scarico risulta quindi essere pari a 20m in modo tale da garantire il deflusso anche in caso di occlusione di qualche scarico.

FIGURA 8-42: COLLEGAMENTO DELLA CANALETTA CON IL COLLETTORE MEDIANTE POZZETTO

Di seguito si mostra il profilo di rigurgito nella canaletta per un tratto studiato, con scarichi ogni 20m. In ALLEGATO 4: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA IN CURVA si riportano i risultati ottenuti.

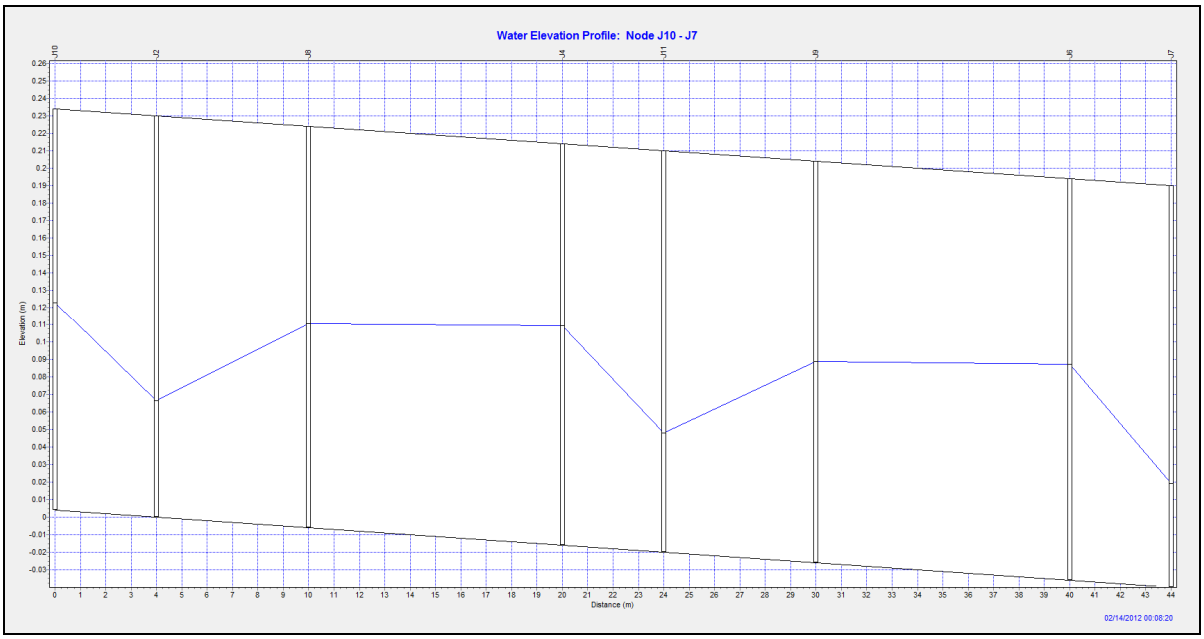


Figura 8-43: Profilo di rigurgito di un tratto di canaletta con pendenza pari a 0.001 e passo scarichi 20 metri

8.2.6. Idraulica degli scarichi e sistemi di raccolta sui viadotti e ponti

Le verifiche da eseguire per quanto riguarda ponti e viadotti sono:

- Verifica dell'interasse tra gli scarichi;
- Verifica dell'igombro della lama d'acqua in caso di totale occlusione degli scarichi;
- Verifica della capacità della tubazione di smaltimento delle acque.

8.2.6.1. Verifica dell'interasse tra gli scarichi

La raccolta e lo scolo delle acque avviene attraverso la canaletta di 5+5 (Figura 8-44) con uscite puntuali nella vasca in acciaio inox di dimensioni 50x30x15cm da cui si accede agli scarichi (Figura 8-45).

L'analisi idraulica parte dalla definita geometria della canaletta e degli scarichi (tubazioni di diametro 20cm) per giungere alla definizione dell'interasse tra gli scarichi stessi. Nella modellazione è stato implementato lo ietogramma corrispondente ad una pioggia di 35.5mm in 15 minuti con un picco di 17.5mm in 5 minuti (Figura 6-6). La larghezza della piattaforma analizzata è variabile, da 7m a 15m, a seconda del viadotto o del ponte analizzato. Il passo degli scarichi risulta essere sempre di 10 metri con una larghezza di allagamento della corsia di emergenza variabile ma comunque sempre inferiore a 1,0m

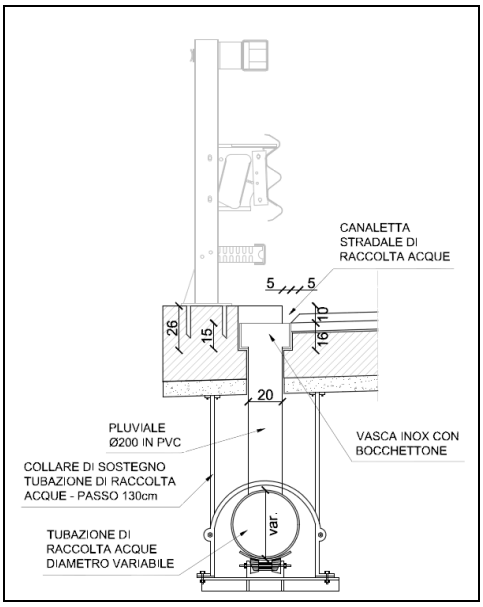


FIGURA 8-44: PARTICOLARE DI SCARICO

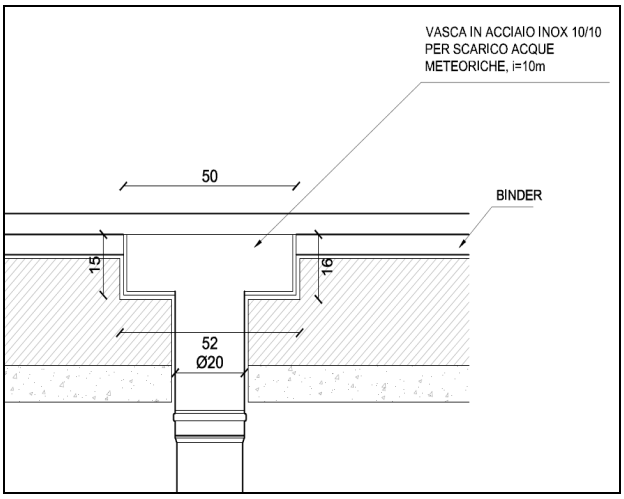


Figura 8-45: particolare vasca inox e bochettone

Di seguito si mostrano i profili di rigurgito dei tratti studiati di canaletta con scarichi ogni 10 metri. In ALLEGATO 5: RISULTATI DIMENSIONAMENTO VIADOTTI E PONTI si riportano i risultati ottenuti.

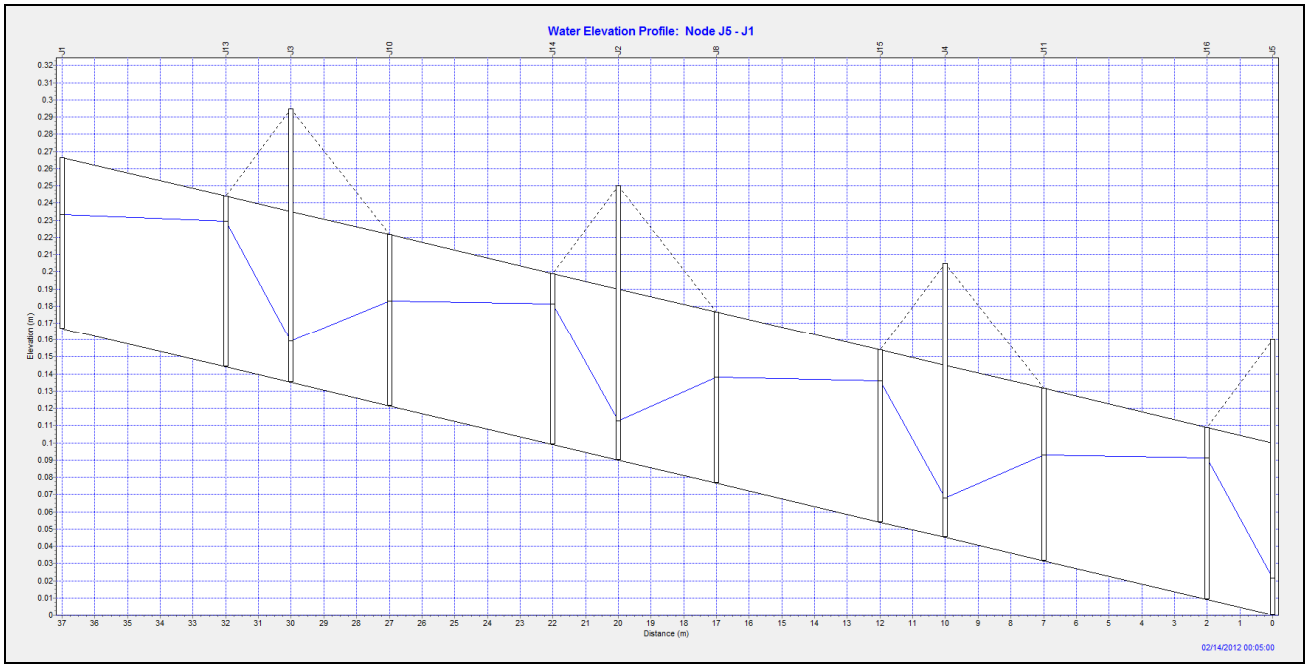


Figura 8-46: Profilo di rigurgito di un tratto di canaletta del Ponte sul t.Crostolo e del Viadotto ad est del T.Crostolo – passo scarichi 10 metri

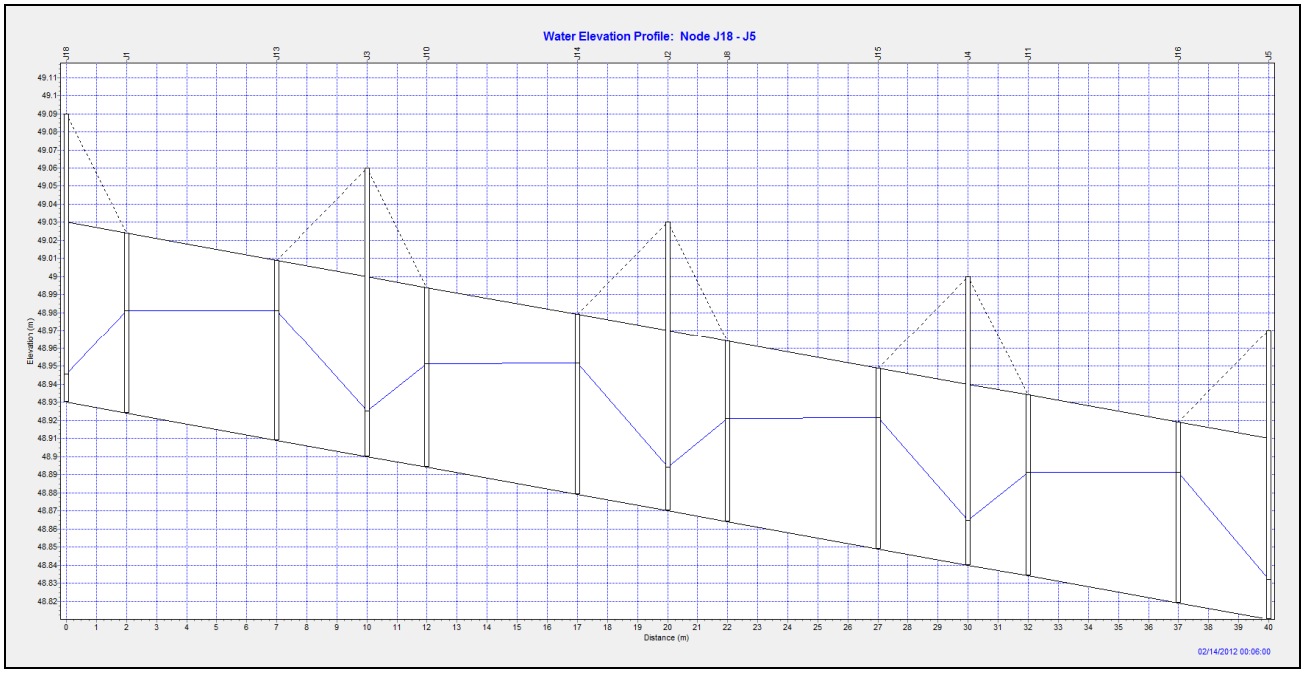


Figura 8-47: Profilo di rigurgito di un tratto di canaletta del Viadotto Casa Gallinari – passo scarichi 10 metri

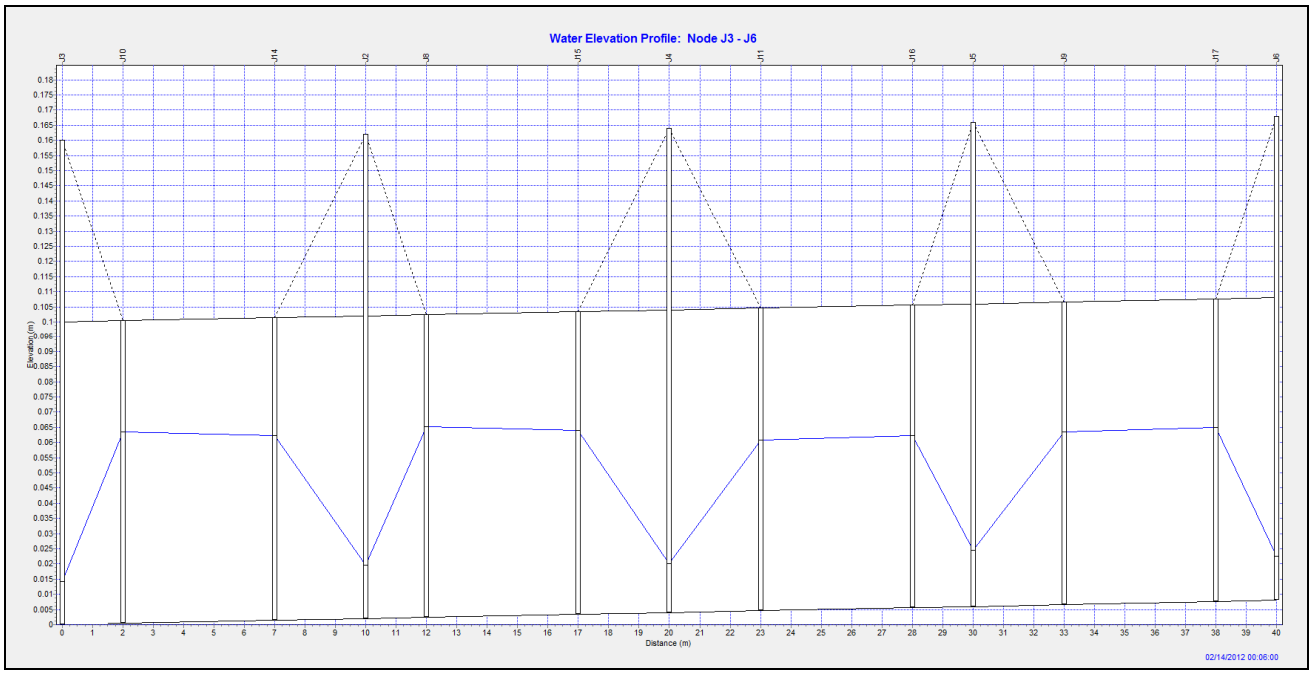


Figura 8-48: Profilo di rigurgito di un tratto di canaletta del ponte sul t.Modolena – passo scarichi 10 metri

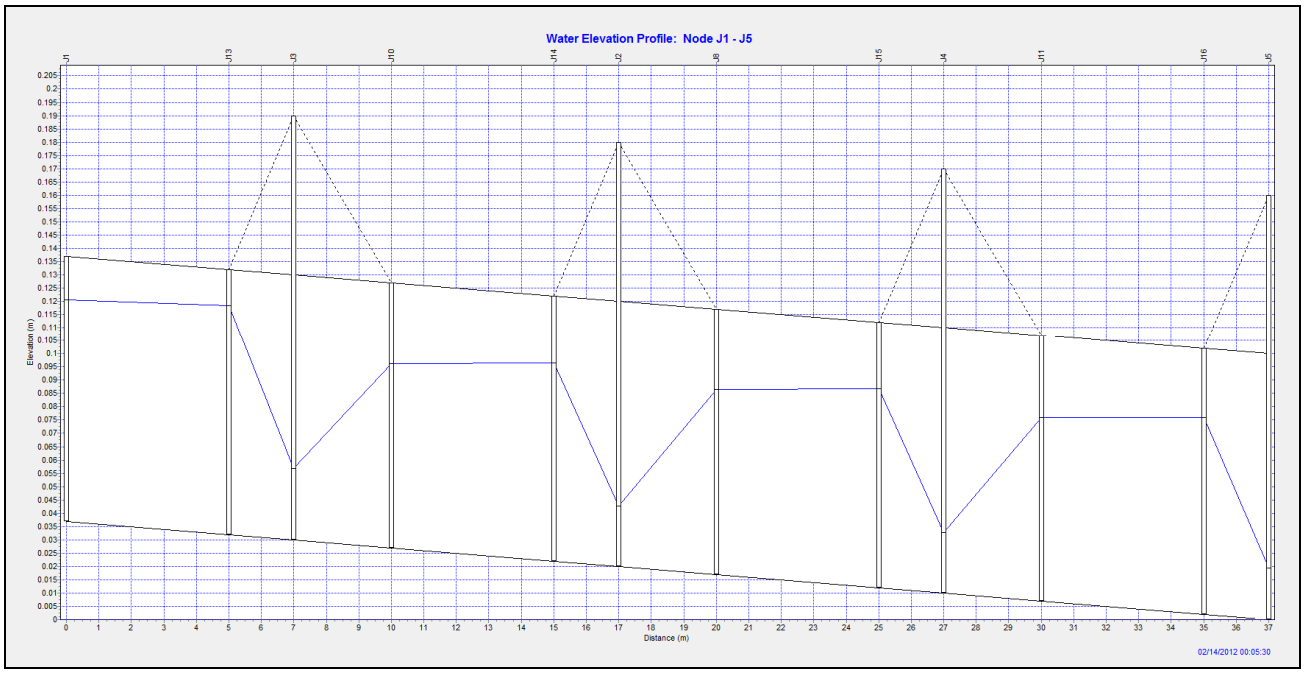


Figura 8-49: Profilo di rigurgito di un tratto di canaletta del ponte sul t.Quaresimo – passo scarichi 10 metri

8.2.6.2. Verifica dell'igombro della lama d'acqua nel caso di totale occlusione degli scarichi

La verifica dell'ingombro della lama d'acqua sulla piattaforma stradale dei ponti e viadotti, nel caso di totale occlusione degli scarichi, è stata condotta per il ponte sul Torrente Crostolo, ma vale per tutti i casi in esame.

Nel caso che tutti gli scarichi siano occlusi durante un evento di pioggia per Tr=25 anni e di durata critica pari a 15 minuti, il battente idraulico che si forma supera i 10cm e quindi si istarura lo stramazza laterale esternamente alla carreggiata. In questo caso funziona solo lo stramazzo laterale e quindi l'igombro della lama d'acqua rimane inferiore ad 1,0m.

8.2.6.3. Verifica della capacità di deflusso della tubazione di smaltimento delle acque di piattaforma

Una volta definito il passo degli scarichi, occorre dimensionare le tubazioni di smaltimento delle acque di piattaforma dei viadotti e ponti. I collettori di raccolta sono progettati in PVC SN8 e il grado di riempimento massimo ammissibile è pari al 70% per tubazioni ≥Ø400 e al 50% per tubazioni <Ø400.

1.1.1.1.1 Ponte sul Torrente Crostolo

Il ponte sul torrente Crostolo ha una lunghezza di circa 60m e si sviluppa interamente in curva. La strada è di categoria B e lo scarico avviene tutto verso Ovest, all'interno di una canaletta in CAV (Figura 8-10) che si raccorda al fosso di guardia in carreggiata nord. Per le verifiche è stata considerata una larghezza della piattaforma stradale pari a 15m. Lo schema di scarico delle acque prevede lo raccolta delle acque di piattaforma del ponte e di una campata del viadotto ad est del Crostolo, per una lunghezza totale di circa 104m.

Il collettore di scarico previsto all'interno curva di entrambe le carreggiate è un Φ400mm in PVC SN8 con pendenza longitudinale almeno pari 0.45%. In tali condizioni si ottiene un grado di riempimento del 69% per la pioggia critica di durata 15' e TR100 anni e del 59% per una pioggia della medesima durata con TR25 anni.

Lo scarico a terra avviene con pluviale sempre del Φ400mm all'interno di una tubazione delle medesime caratteristiche che raggira la spalla sinistra del ponte e si raccorda alla canalatetta in CAV precedentemente citata. uest'ultima è collegata al fosso di guardia che, in corrispondenza dello scarico, è rivestito per 1,0m con cls C25/30 armato con rete elettrosaldata Φ6 e maglia 15x15cm (Figura 8-57 e Figura 8-58).

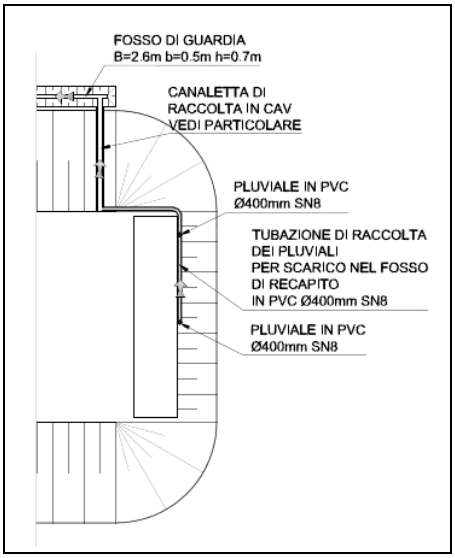


Figura 8-50: schema planimetrico dello scarico delle acque di piattaforma dal ponte del T.Crostolo

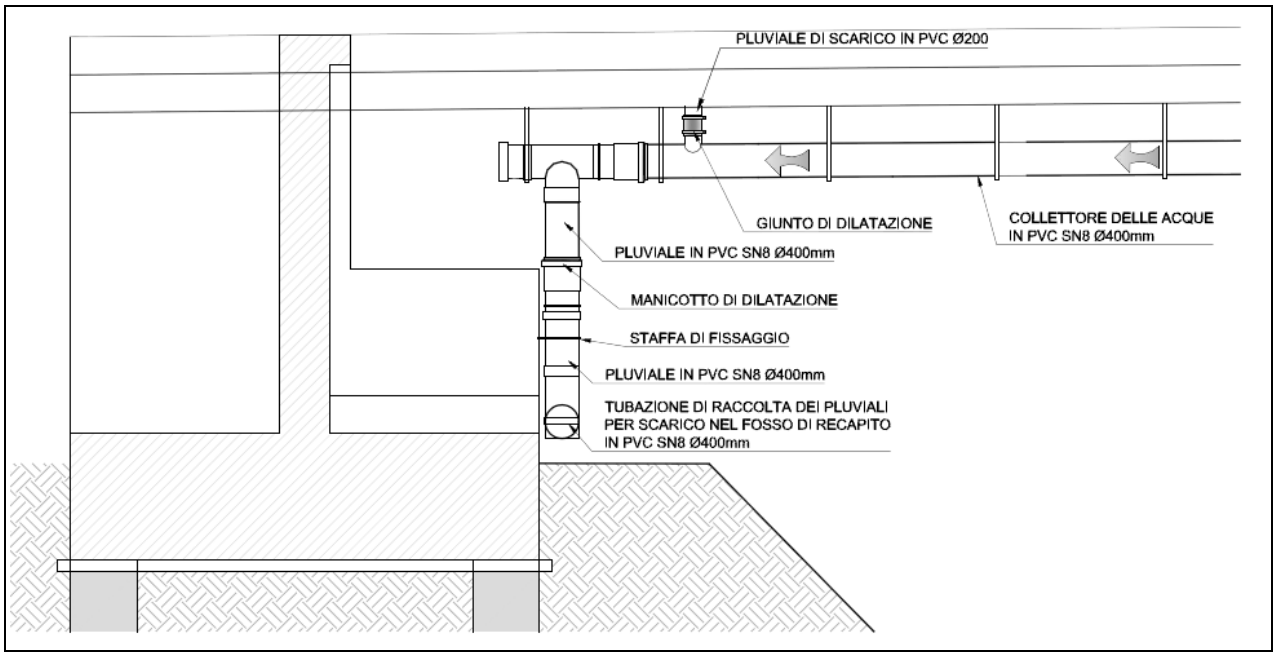


Figura 8-51: schema dello scarico delle acque di piattaforma dal ponte del T. Crostolo con pluviale

Di seguito si mostra il profilo di rigurgito all'interno del collettore nella condizione critiva di 15' e TR=25anni, mentre in ALLEGATO 5: RISULTATI DIMENSIONAMENTO VIADOTTI E PONTI si riportano i risultati nella condizione critica di 15' per TR25 e TR100 anni e di 30' per TR100 anni.

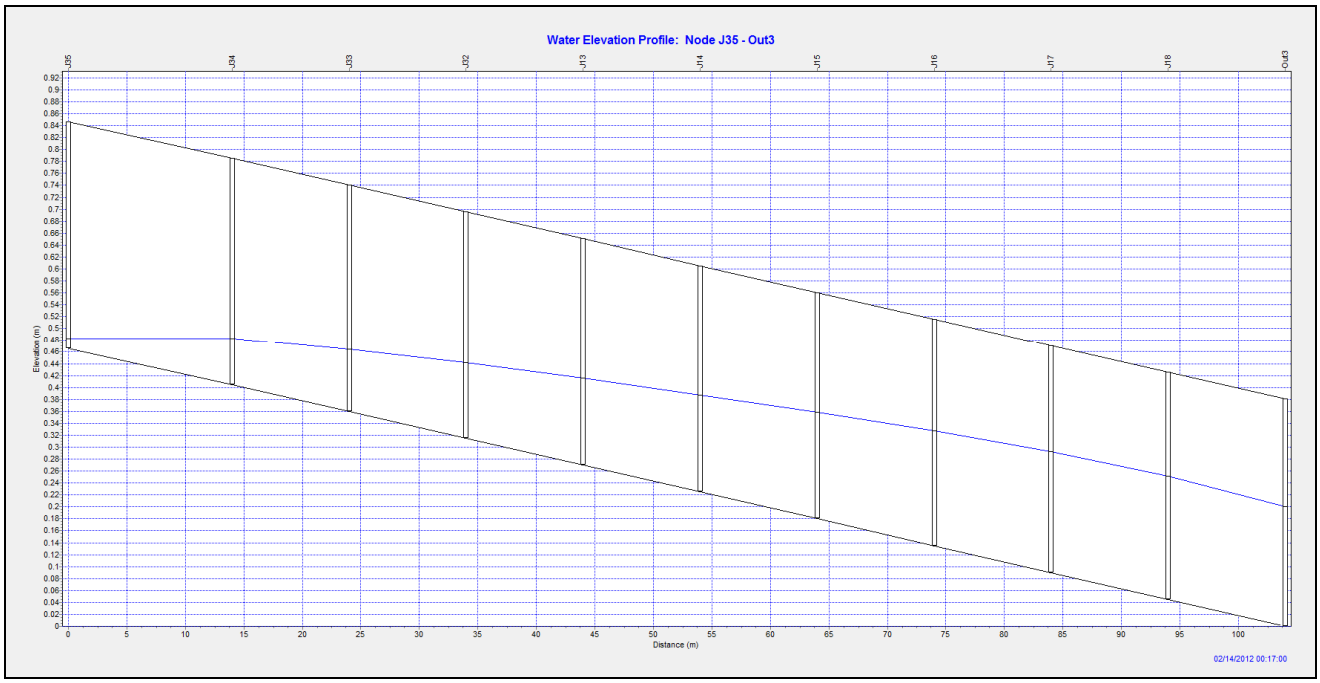


Figura 8-52: Torrente Crostolo - Profilo di rigurgito all'interno del collettore Φ400, D=15' TR=25anni

1.1.1.1.2 Viadotto ad Est del Torrente Crostolo

Il viadotto ad Est del torrente Crostolo ha una lunghezza complessiva di circa 170m e si sviluppa interamente in curva. La strada è di categoria B e lo scarico avviene tutto verso Est. La porzione di viadotto in esame è di 137m, poiché la prima campata di 34m scola a Ovest. Per le verifiche è stata considerata una larghezza della piattaforma stradale pari a 15m.

Il collettore di scarico previsto all'interno curva di entrambe le carreggiate è un Φ315mm in PVC SN8 continuo per l'intero tratto di 137m e con pendenza longitudinale almeno pari 0.60%. In corrispondenza di ogni pila, il collettore scarica all'interno di un pluviale Φ200mm in PVC SN8 che, come si puo vedere nella Figura 8-6, recapita le acque all'interno di un pozzetto in CA prefabbricato e poi ad un sistema di condotte Φ800mm in CA che collettano le acque da trattare alla depurazione. In tali condizioni si ottiene un grado di riempimento del 47% per la pioggia critica di durata 15' e TR100 anni e del 40% per una pioggia della medesima durata con TR25 anni.

Di seguito si mostra il profilo di rigurgito all'interno del collettore nella condizione critiva di 15' e TR=25anni, mentre in ALLEGATO 5: RISULTATI DIMENSIONAMENTO VIADOTTI E PONTI si riportano i risultati nella condizione critica di 15' per TR25 e TR100 anni e di 30' per TR100 anni.

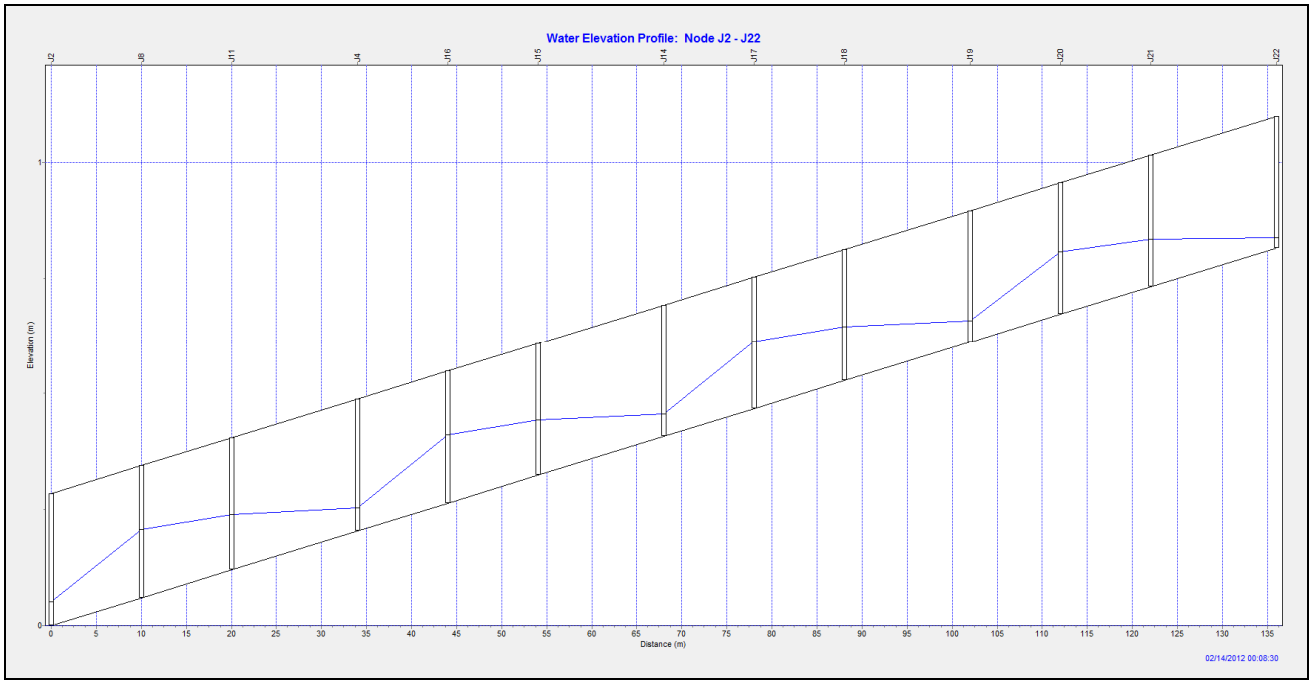


Figura 8-53: Viadotto ad est del Torrente Crostolo - Profilo di rigurgito all'interno del collettore Ø315, D=15' TR=25anni

1.1.1.1.3 Viadotto Casa Gallinari

Il Cavalcavia Casa Gallinari ha una lunghezza di circa 150m e si sviluppa interamente in curva. La strada è di categoria B e lo scarico avviene, una quota parte verso Ovest e l'altra verso Est. Per le verifiche è stata considerata una larghezza della piattaforma stradale pari a 15m.

Il collettore di scarico previsto all'interno curva di entrambe le carreggiate è un Φ500mm in PVC SN8 con pendenza longitudinale variabile in funzione del tratto considerato come di seguito argomentato:

- la carreggiata Nord del viadotto presenta il displivio in corrispondenza della pila denominata "P2D" cioè la seconda da Ovest, non considerando la spalla. Ad Ovest del displuvio il collettore ha una lunghezza di 60m e pendezza almeno pari a 0,30%, mentre ad Est la lunghezza è di 90m e la pendezza almeno pari a 0,44%;
- la carreggiata Sud del viadotto presenta il displivio in corrispondenza della pila denominata "P3S" cioè la terza da Ovest, non considerando la spalla. Ad Ovest del displuvio il collettore ha una lunghezza di 90m e pendezza almeno pari a 0,44%, mentre ad Est la lunghezza è di 60m e la pendezza almeno pari a 0,30%;

In tali condizioni si ottiene un grado di riempimento del 55% per la pioggia critica di durata 15' e TR100 anni e del 47% per una pioggia della medesima durata con TR25 anni.

Lo scarico a terra avviene in corrispondenza delle spalle del viadotto con pluviale del Φ400mm che scarica all'interno di una canaletta in CAV (Figura 8-10) posta sulla scarpata. La canaletta si raccorda al fosso di guardia che in corrispondenza dello scarico è rivestito per 1,0m con cls C25/30 armato con rete elettrosaldata Φ6 e maglia 15x15cm, come mostrato in Figura 8-54 e Figura 8-55.

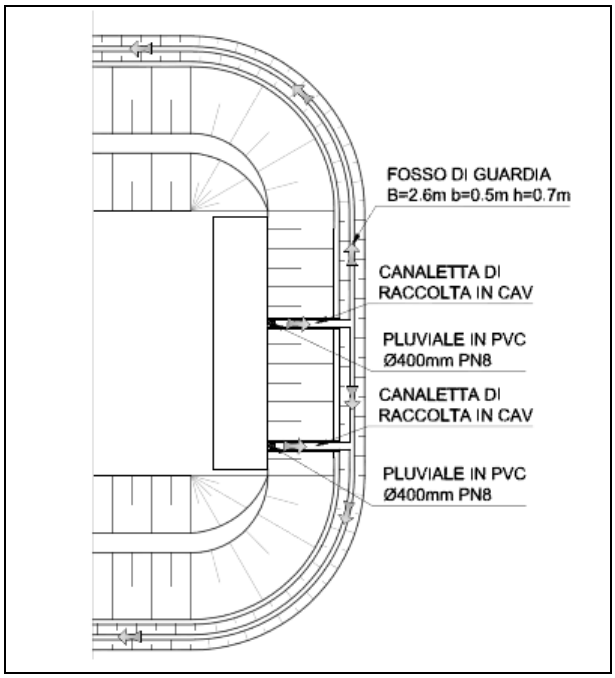


Figura 8-54: schema planimetrico dello scarico delle acque di piattaforma dal Viadotto a Est del T.Crostolo

Di seguito si mostra il profilo di rigurgito all'interno del collettore nella condizione critiva di 15' e TR=25anni, mentre in ALLEGATO 5: RISULTAI DIMENSIONAMENTO VIADOTTI E PONTI si riportano i risultati nella condizione critica di 15' per TR25 e TR100 anni e di 30' per TR100 anni.

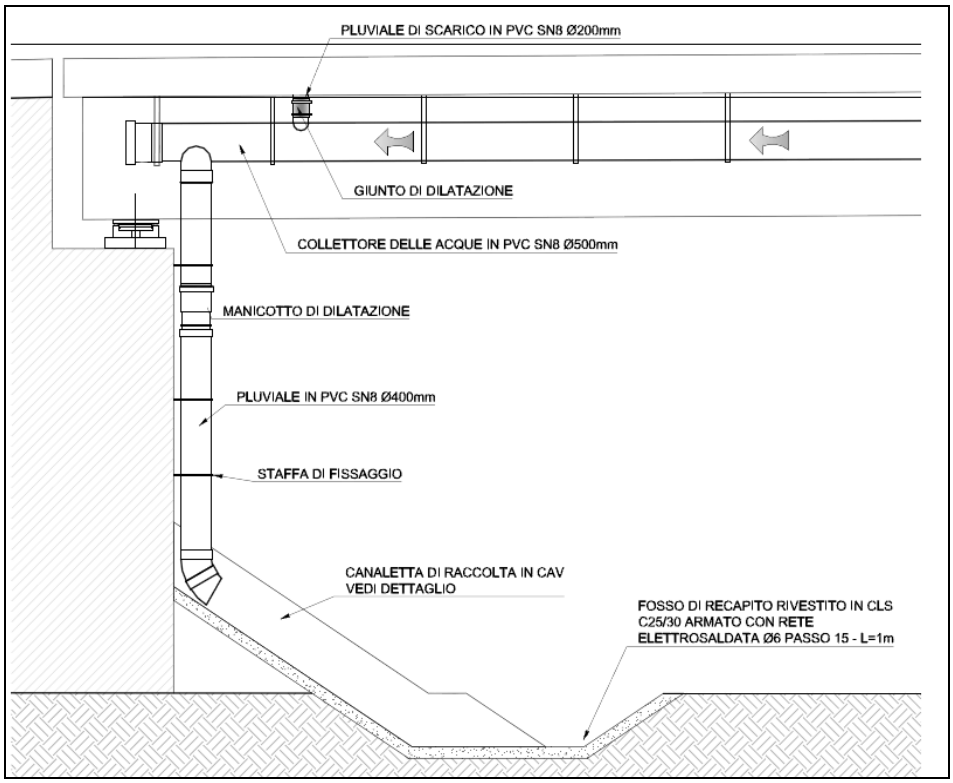


Figura 8-55: schema dello scarico delle acque di piattaforma dal Viadotto a Est del T. Crostolo con pluviale e canaletta

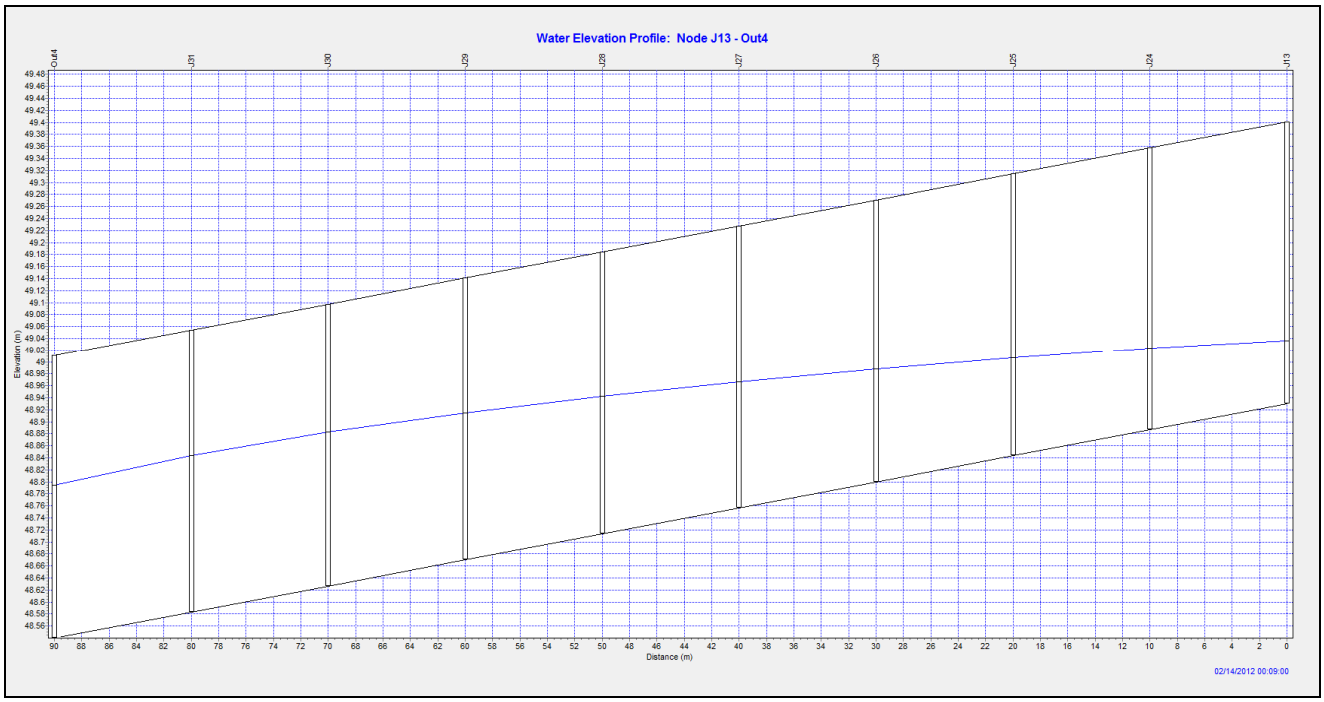


Figura 8-56: Cavalcavia Casa Gallinari - Profilo di rigurgito all'interno del collettore Ø500mm, D=15' TR=25anni

1.1.1.1.4 Ponte sul Torrente Modolena

Il Ponte sul Torrente Modolena ha una luce di 29m e si sviluppa interamente in rettilineo. La strada è di categoria C1 e gli scarichi avvengono tutti verso Ovest.

Per le verifiche è stata considerata una larghezza della piattaforma stradale pari a 7m. Lo schema di scarico delle acque prevede lo raccolta delle acque di piattaforma del ponte per una lunghezza totale di circa 38m.

Il collettore che si rende necessario è un Ø315mm in PVC SN8 sia in carreggiata Nord che Sud, poiché siamo in rettilineo. La pendezza longitudinale dei collettori sono almeno pari a 0,10%.

In tali condizioni si ottiene un grado di riempimento del 57% per la pioggia critica di durata 15' e TR100 anni e del 49% per una pioggia della medesima durata con TR25 anni.

Lo scarico a terra avviene in corrispondenza della spalla di sponda sinistra, sia in carreggiata Nord che Sud. Il pluviale del Φ315mm scarica all'interno di una tubazione delle medesime caratteristiche che raggira la spalla del ponte e si raccorda alla canaletta in CAV (Figura 8-10). uest'ultima è collegata al fosso di guardia che, in corrispondenza dello scarico, è rivestito per 1,0m con cls C25/30 armato con rete elettrosaldata Φ6 e maglia 15x15cm (Figura 8-57 e Figura 8-58).

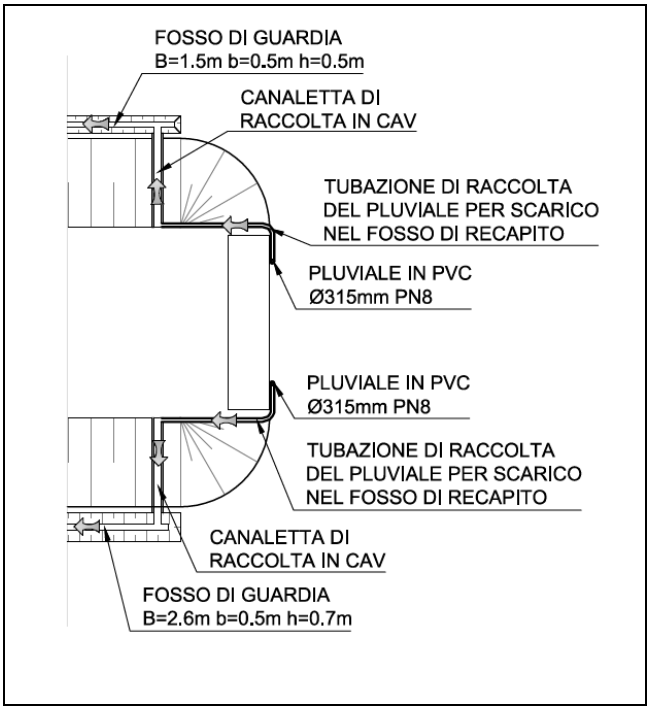


Figura 8-57:schema planimetrico dello scarico delle acque di piattaforma dal Ponte del T. modolena

Di seguito si mostra il profilo di rigurgito all'interno del collettore nella condizione critiva di 15' e TR=25anni, mentre in ALLEGATO 5 si riportano i risultati nella condizione critica di 15' per TR25 e TR100 anni e di 30' per TR100 anni.

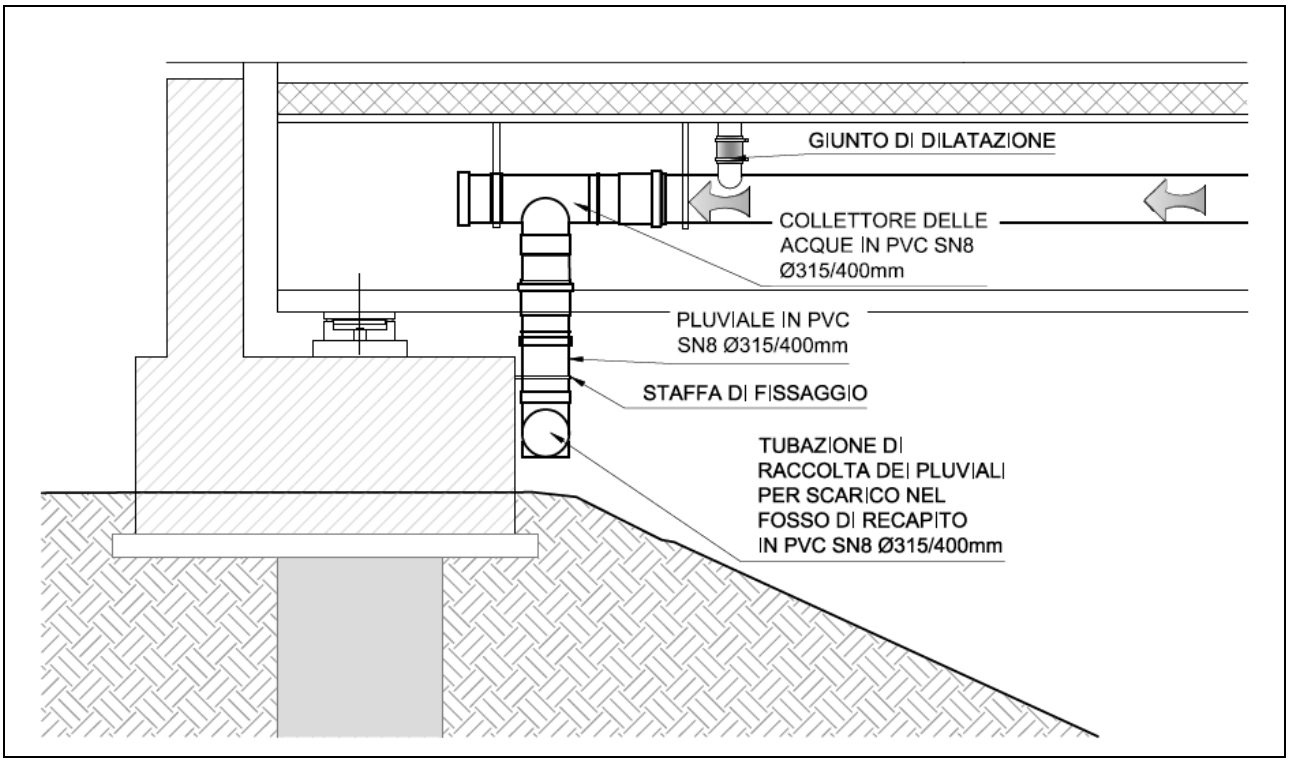


Figura 8-58: schema dello scarico delle acque di piattaforma dal Ponte del T. modolena con pluviale

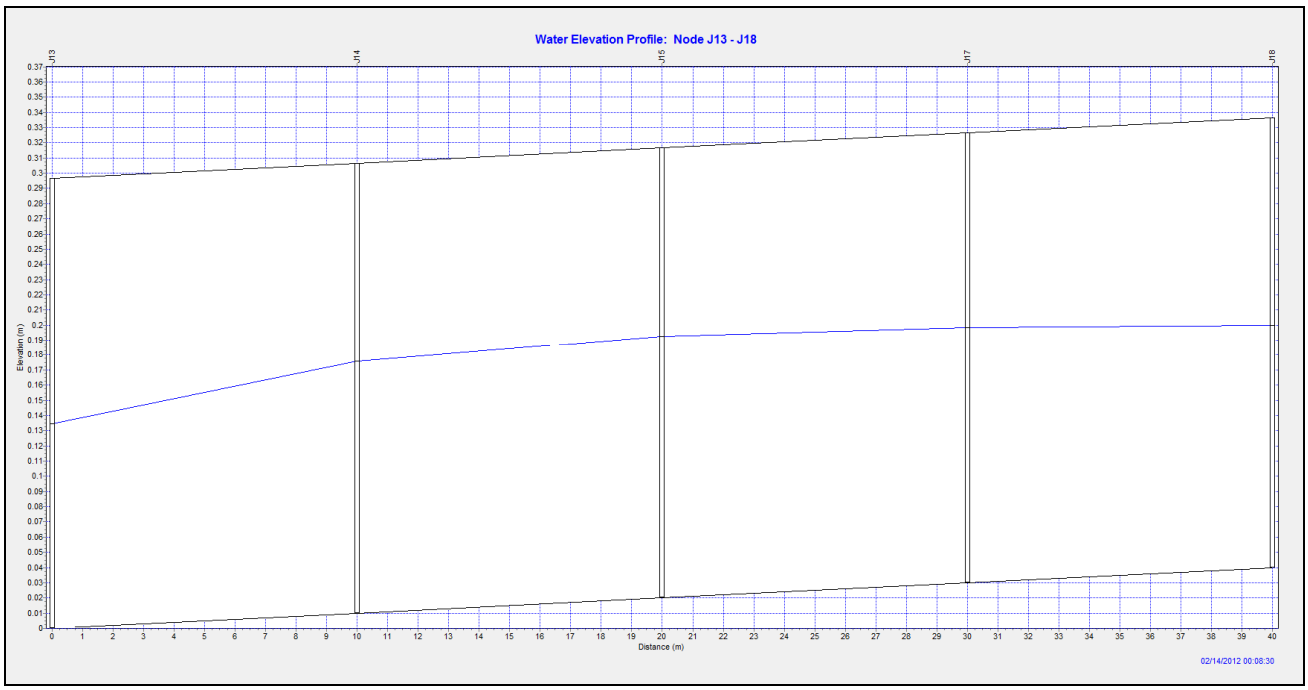


Figura 8-59: Torrente Modolena - Profilo di rigurgito all'interno del collettore Ø315mm, , D=15' TR=25anni

1.1.1.1.5 Ponte sul Torrente Quaresimo

Il Ponte sul Torrente Quaresimo ha una luce di 29m e si sviluppa interamente in curva. La strada è di categoria C1 e gli scarichi avvengono tutti verso Est.

Per le verifiche è stata considerata una larghezza della piattaforma stradale pari a 15m. Lo schema di scarico delle acque prevede lo raccolta delle acque di piattaforma del ponte per una lunghezza totale di circa 38m.

Il collettore che si rende necessario è un Ø400mm in PVC SN8 in carreggiata Sud con pendezza longitudinale almeno pari a 0,10%.

In tali condizioni si ottiene un grado di riempimento del 54% per la pioggia critica di durata 15' e TR100 anni e del 42% per una pioggia della medesima durata con TR25 anni.

Lo scarico a terra avviene in corrispondenza della spalla di sponda destra, in carreggiata Sud. Il pluviale del Φ400mm scarica all'interno di una tubazione delle medesime caratteristiche che raggira la spalla del ponte e si raccorda alla canaletta in CAV (Figura 8-10). uest'ultima è collegata al fosso di guardia che, in corrispondenza dello scarico, è rivestito per 1,0m con cls C25/30 armato con rete elettrosaldata Φ6 e maglia 15x15cm (Figura 8-60 e Figura 8-61).

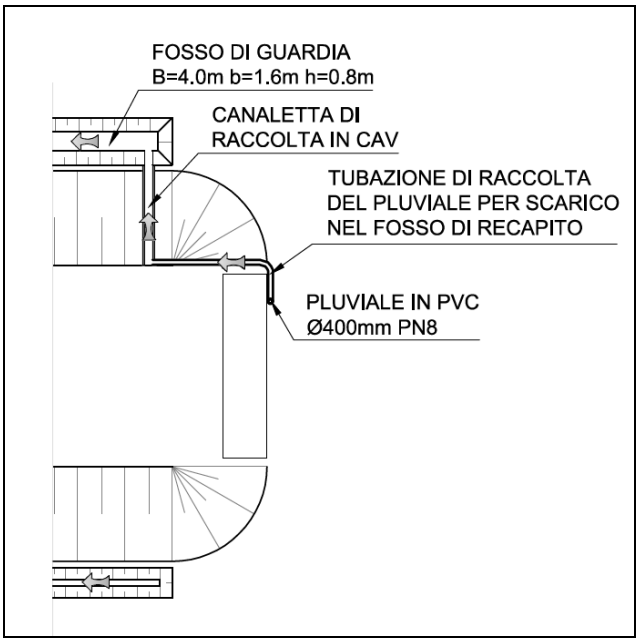


Figura 8-60:schema planimetrico dello scarico delle acque di piattaforma dal Ponte del T. Quaresimo

Di seguito si mostra il profilo di rigurgito all'interno del collettore nella condizione critiva di 15' e TR=25anni, mentre in ALLEGATO 5 si riportano i risultati nella condizione critica di 15' per TR25 e TR100 anni e di 30' per TR100 anni.

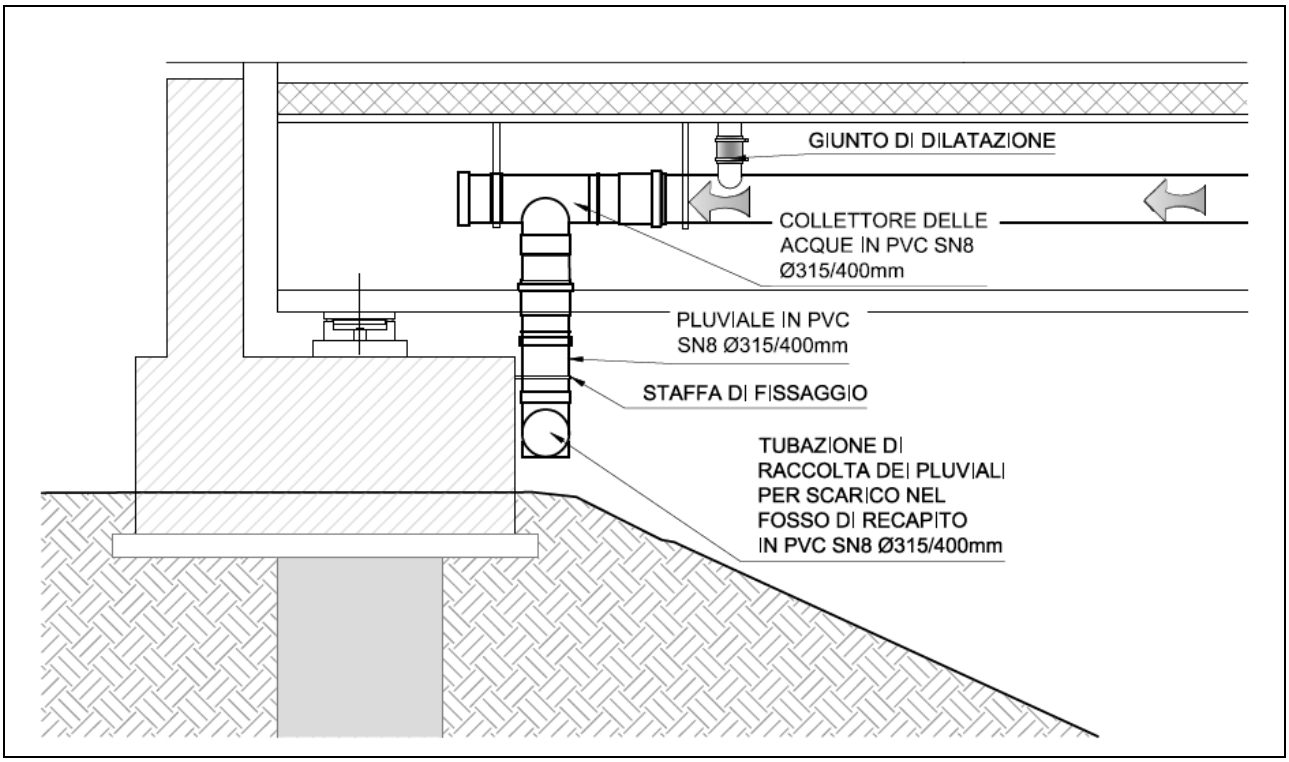


Figura 8-61: schema dello scarico delle acque di piattaforma dal Ponte del T. Quaresimo con pluviale

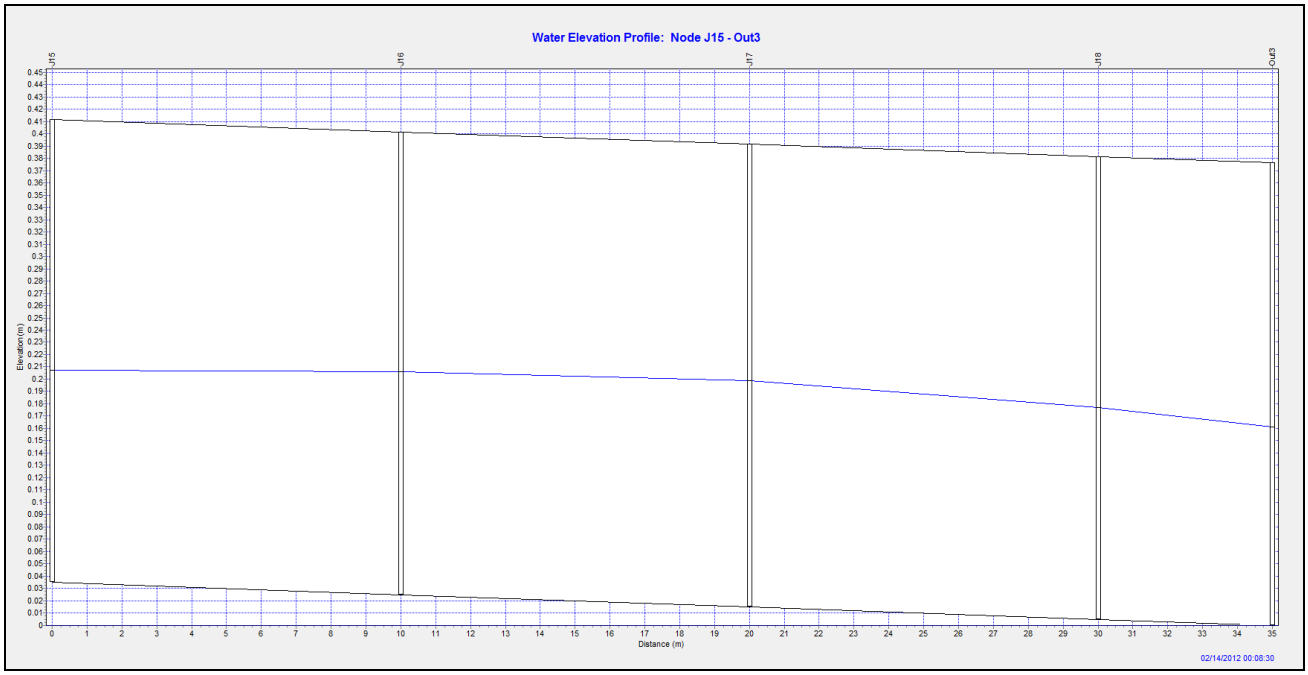


Figura 8-62: Torrente Quaresimo - Profilo di rigurgito all'interno del collettore Ø400mm

8.2.6.4. Verifica delle massime dilatazioni nelle tubazioni in plastica

Le tubazioni in plastica sono sottoposte ad aumenti di temperatura e di conseguenza ad una dilatazione. In tali condizioni, è necessario consentire alla tubazione di allungarsi, continuando a svolgere la funzione per la quale è stata installata, alle stesse condizioni di sicurezza. Se la tubazione si trova fissata tra due punti, la dilatazione provocherà il suo svergolamento. In altri casi, può essere la tubazione che si deforma, arrivando anche alla rottura. Per evitare tali inconvenienti, occorre calcolare l'allungamento maggiore dovuto al massimo salto termico prevedibile, cioè la differenza che intercorre tra la massima temperatura d'esercizio e la minima (che potrebbe essere causata da condizioni ambientali invernali, se il tubo è all'esterno).

L'allungamento è proporzionale alla lunghezza della tubazione e al coefficiente di dilatazione lineare, che è una caratteristica del materiale della tubazione, e si calcola con la formula: $\Delta L = \alpha * l * \Delta t$

dove ΔT=50℃ , ΔL (mm) è l'allungamento dovuto alla variazione di temperatura Δt di un tratto l (m) di tubazione compreso tra due punti fissi; α è il coefficiente di dilatazione lineare del materiale (mm/m*℃) che per il PVC è circa 0,08.

Per ottenere il numero di giunti necessari si divide il valore ottenuto della variazione di lunghezza ΔL, per il 90% del valore della corsa del giunto di dilatazione che è pari a 80mm.

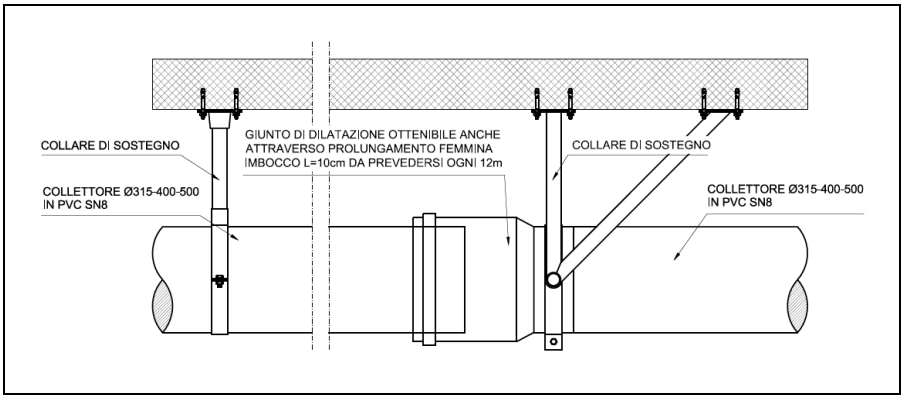


Figura 8-63: Particolare condotta in corrispondenza del giunto di dilatazione

Considerando una tubazione in PVC di 60m di lunghezza, si ottiene un possibile allungamento pari a 240mm che diviso per il 90% di 80mm, porta un passo tra i giunti pari a 15m. Essendo che, le tubazioni vengono fornite in verghe da 6m serve un giunto di dilatazione ogni 12m. In questo modo la diltazione rimane contenuta in 4,8cm.

In tutte le tubazioni il passo con cui è stato previsto l'inserimento dei supporti è pari a 1,30m, tutti i particolari progettuali sono riportati nella tavola PP00ID00IDRST05A.

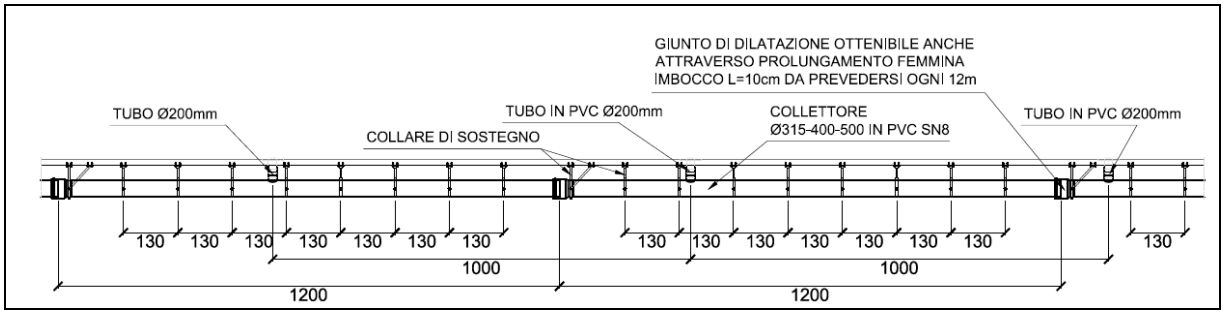


Figura 8-64: Schema longitudinale dei fissaggi in relazione ai giunti di dilatazione e alle caditoie

8.2.7. Idraulica dei sistemi di raccolta nella trincea e nei sottovia

Preliminarmente e con l'applicazione del processo modellistico precedentemente adottato, sono state definite, anche per i sottovia e la Trincea di Corte Tegge, le dimensioni dei collettori che scolano le acque provenienti dalla piattaforma stradale e le recapitano alla vasca di accumulo; quindi si è proceduto al dimensionamento della vasca stessa che precede l'impianto di sollevamento. Nel caso della trincea l'impianto di sollevamento è preceduto dall'impianto di depurazione in quanto, le acque generate dalla piattaforma della tangenziale occorre trattarle prima dello scarico nel corpo idrico recettore.

Le caratteristiche degli elementi di input sono quelle definite al paragrafo 7.2.

Nella modellazione sono stati implementati gli ietogrammi corrispondenti a piogge di durata 15', 30' e 45' e TR=100anni, al fine di valutare il grado di riempimento dei collettori, previsti in PeAd SN8 con diametro interno minimo di 400mm. Il grado di riempimento dei collettori risulta sempre inferiore al 70% nel caso di TR=25 anni come richiesto da ANAS, ma non solo, infatti per TR=100 anni la percentuale non supera mai l'80%.

Le diverse procedure modellistiche dimostrano che l'intensità di pioggia critica è quella pari a Tp=15', per cui le tubazioni ed i sistemi di raccolta ed evacuazione sono dimensionati per smaltire una portata generata da una precipitazione di 15 minuti e TR=100anni.

Di seguito sono elencati i sottovia e la trincea di seguito analizzati, con il loro codice identificativo e i diametri interni utilizzati per i collettori di scarico.

Tabella 8-2: Elenco dei sottovia e trincea analizzati

Codice	Trincea/Sottovia	Diametro interno condotte [mm]
ST01	Sottovia Rete2	400-600-700
ST02	Sottovia di via Hiroshima	400-600-700
ST03	Sottovia di Pieve-Modolena	400-600-700
ST04	Sottovia di via K.Marx	400-600
ST05	Trincea di Corte Tegge	400-600-800
ST06	Sottovia di via Ferraroni	400-600
ST07	Sottopasso Roncocesi	400

Di seguito si mostrano i profili di rigurgito all'interno dei collettori previsti per la Trincea di Corte Tegge e per i sottovia studiati, ad eccezione del Sottopasso Roncocesi, che essendo un sottopasso poderale di modeste dimensioni è stato analizzato diversamente. In ALLEGATO 6: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA NELLA TRINCE si riportano i risultati ottenuti per le diverse durate di pioggia =15'-30'-45' e per un evento con TR100 anni.

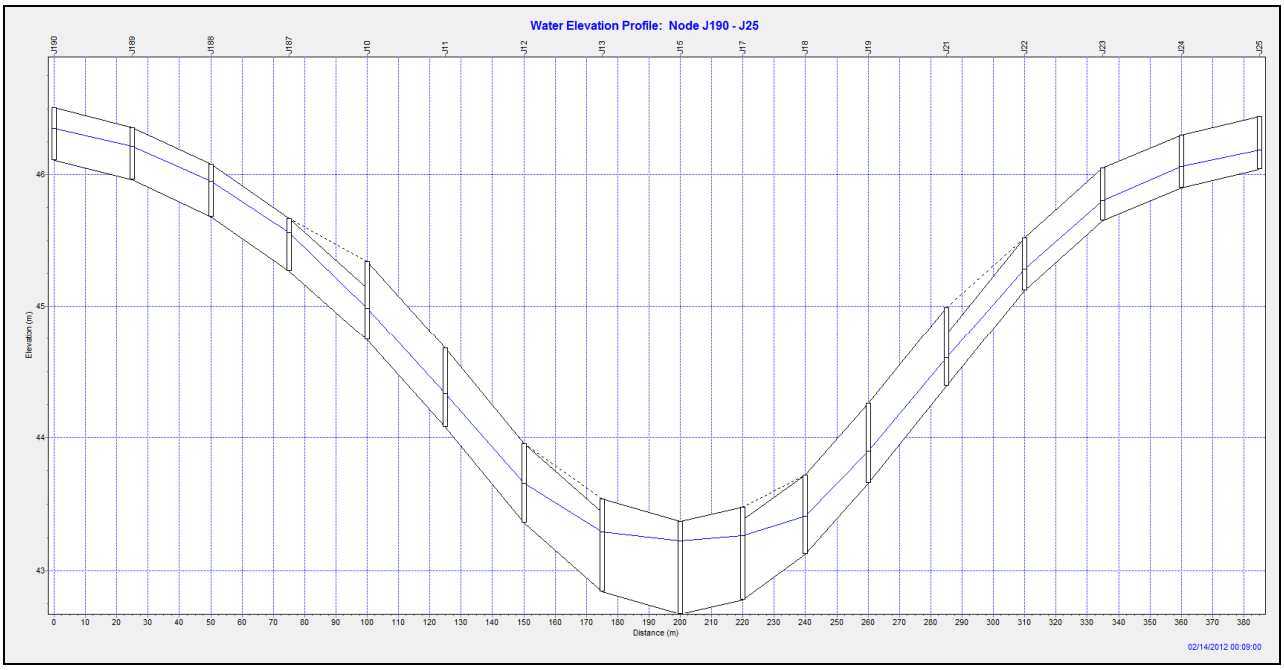


Figura 8-65: Profilo di rigurgito all'interno dei collettori del sottovia di Rete 2 (ST01)

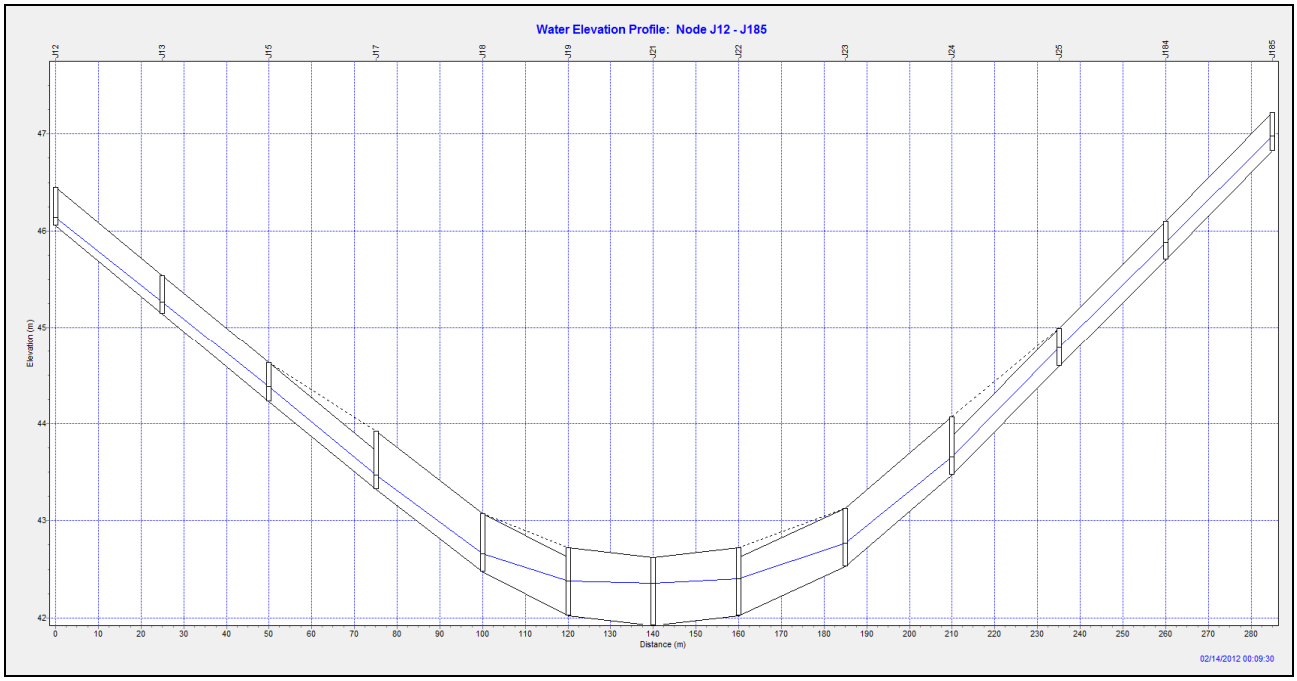


Figura 8-66: Profilo di rigurgito all'interno dei collettori del sottovia di via Hiroshima (ST02)

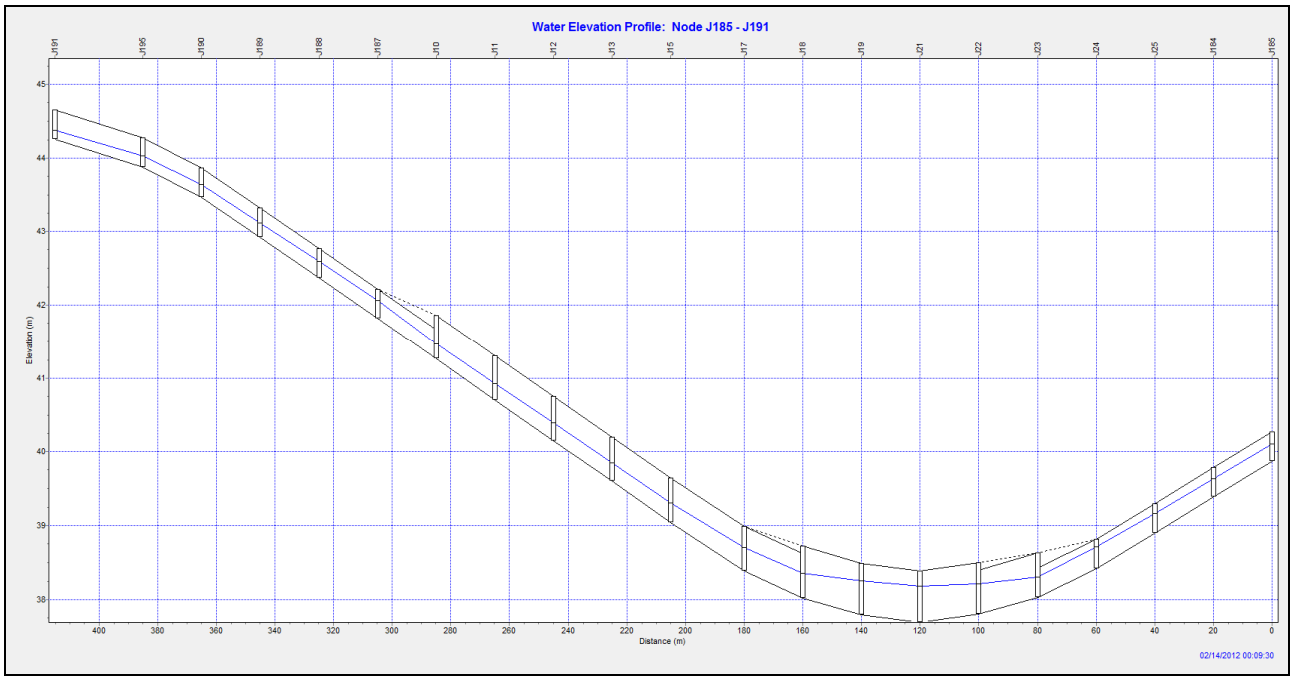


Figura 8-67: Profilo di rigurgito all'interno dei collettori del sottovia pieve-Modolena (ST03)

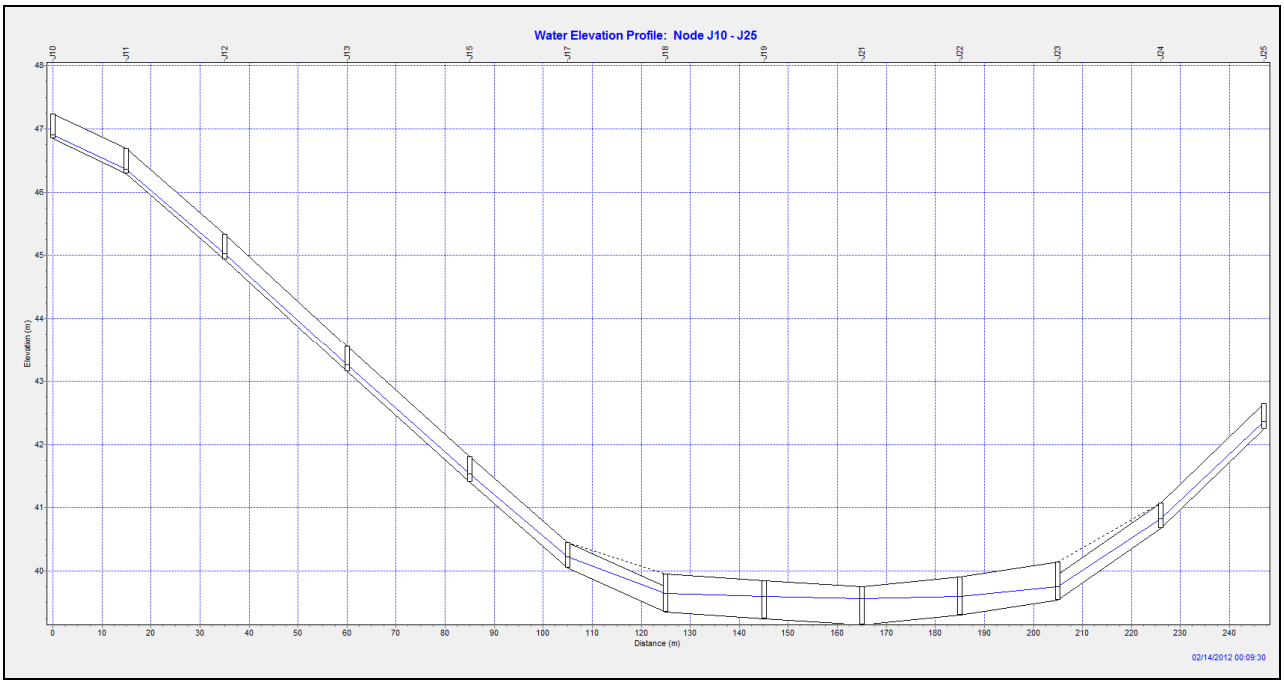


Figura 8-68: Profilo di rigurgito all'interno dei collettori del sottovia di k. Marx (ST04)

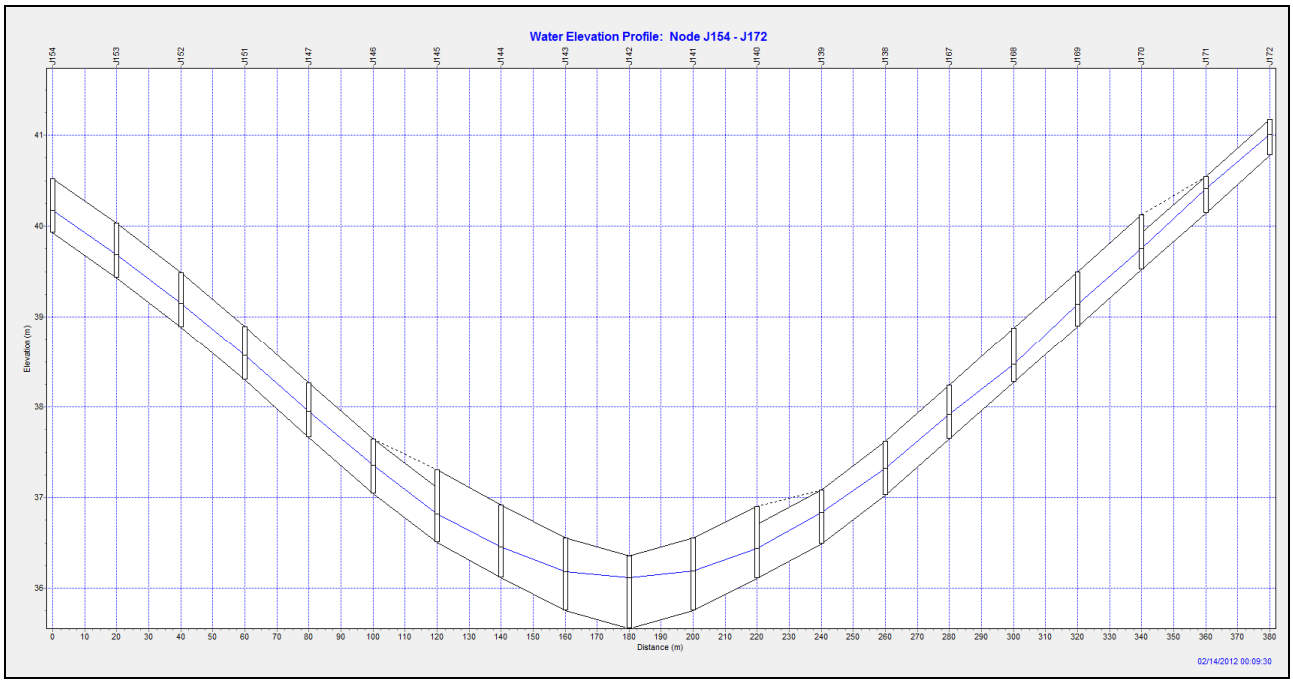


Figura 8-69: Profilo di rigurgito all'interno dei collettori della trincea di corte tegge (ST05)

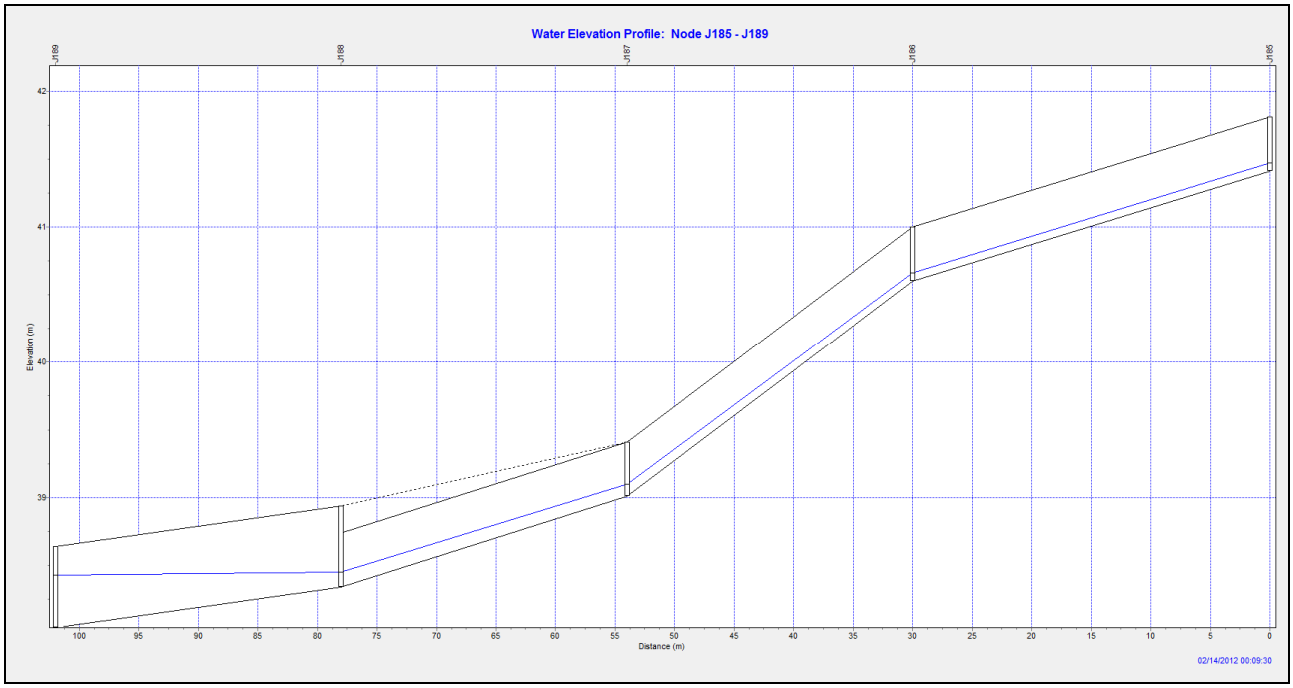


Figura 8-70: Profilo di rigurgito all'interno dei collettori del sottovia di via Ferraroni (ST06)

Il sistema di raccolta delle acque di piattaforma per i sottovia e per la trincea si distingue in funzione del tratto di strada considerato:

1. tratto di strada all'interno della paratia di diaframmi per il contenimento delle scarpate;
2. tratto di strada all'esterno della paratia di diaframmi, dove la stessa passa da moderatamente in trincea fino ad 1,0m in rilevato, altezza considerata come limite di sicurezza per eventuali fenomeni di allagamento dei corsi d'acqua circostanti.

Il sistema di raccolta delle acque di piattaforma all'interno della paratia di diaframmi è costituito da una canaletta prefabbricata in cls di dim. 70x40cm, continua per l'intero tratto in esame, che scarica le acque all'interno dei collettori mediante pozzetti in c.a. distribuiti con passo ≤ 24m. Le dimensioni dei pozzetti variano a seconda della larghezza della banchina stradale e quindi del sottovia considerato: nel caso dei sottovia/trincea ST01, ST02, ST03 e ST05 sono previsti un pozzetti in CA di dimensioni 120x120cm (Figura 8-71), nel caso dei sottovia ST04, ST06 e ST07 le dimensioni del pozzetto sono 80x80cm (Figura 8-72). Entrambe le tipologie sono corredate da griglia in ghisa sferoidale classe D400 gruppo 4 EN 124:1994 con superficie di scarico minimo 1000cm^2.

Il sistema di raccolta delle acque di piattaforma all'esterno della paratia di diaframmi è costituito da una serie di pozzetti in CA di dimensioni 80x80cm con griglia in ghisa sferoidale, analoga a quella precedente, distribuiti con passo ≤20m sul bordo della strada. L'acqua della piattaforma stradale stramazza all'interno del pozzetto per poi essere convogliata in un sistema di condotte, collegato ai tubi che costituiscono il sistema di scarico descritto inizialmente, cioè quello all'interno della paratia di diaframmi (Figura 8-73).

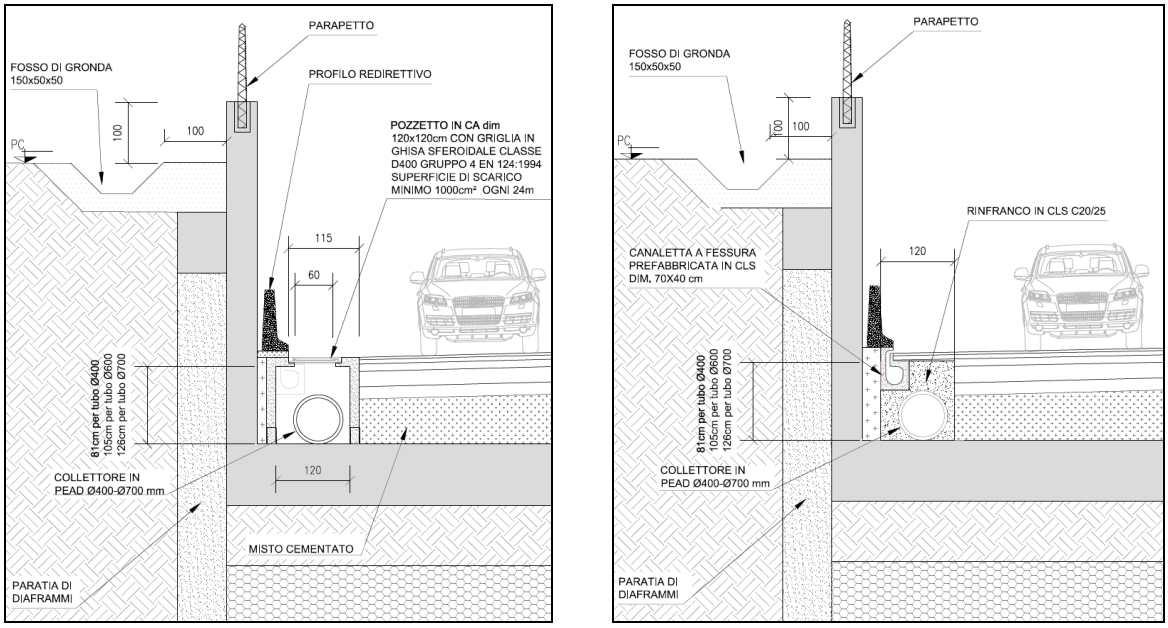


Figura 8-71: Particolari di scarico per sottovia ST01-ST02-ST03- ST05 con pozzetto 120cm x 120cm

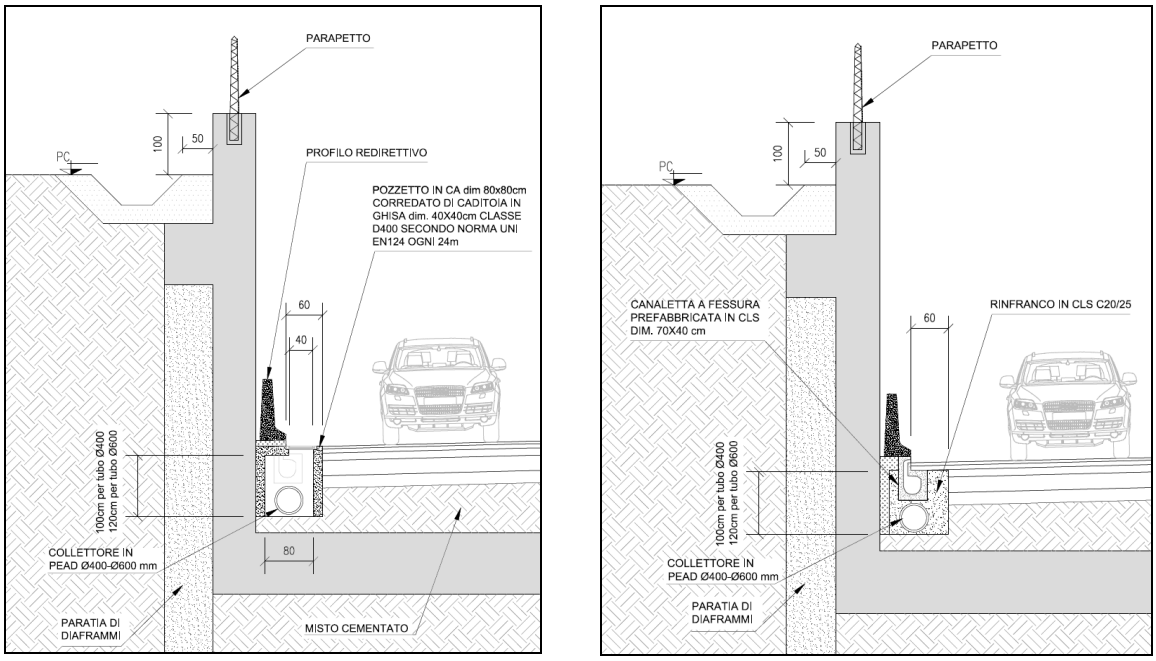


Figura 8-72: Particolari di scarico per sottovia ST04-ST06-ST07, con pozzetto 80cm x 80cm

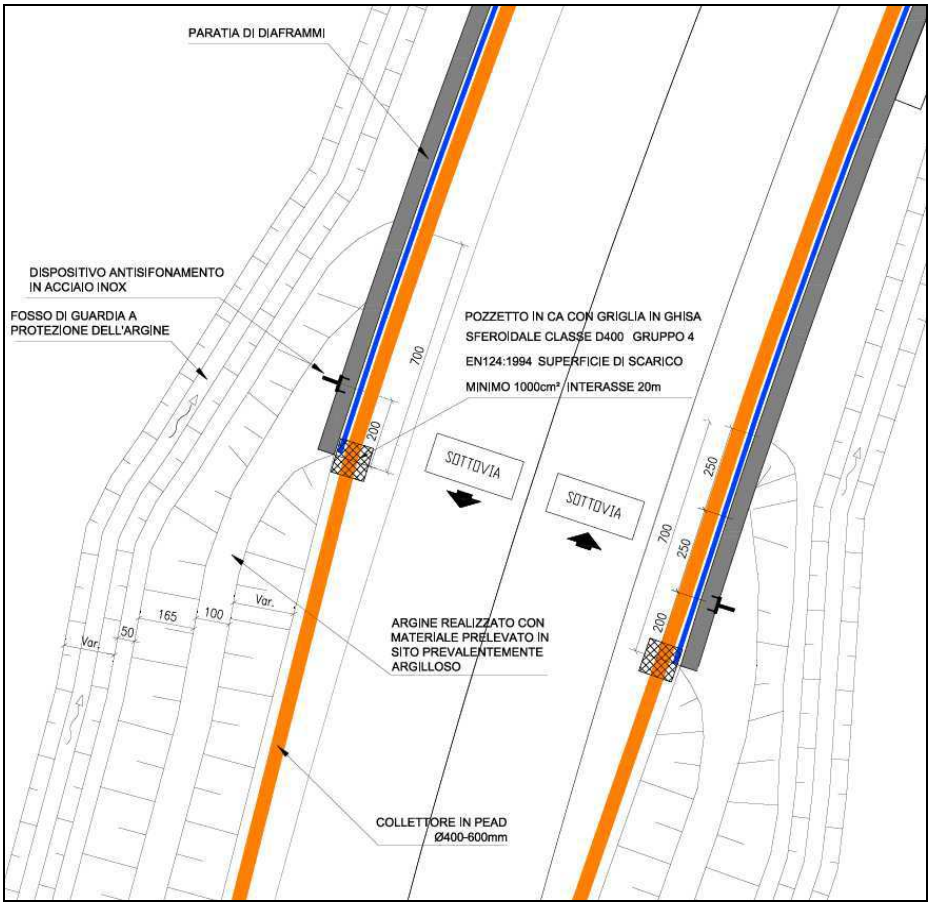


Figura 8-73: Pianta – Argine a difesa del sottovia con sistema di raccolta acque a monte del diaframma

In ingresso ed in uscita della trincea e dai sottovia, ove le condizioni stradali lo rendono necessario, è stato previsto un argine in terra di altezza pari ad 1.10m, che ha la funzione di evitare l'ingresso nel sottovia/trincea di acqua derivante dall'esondazione dei corsi d'acqua circostanti (Figura 8-74).

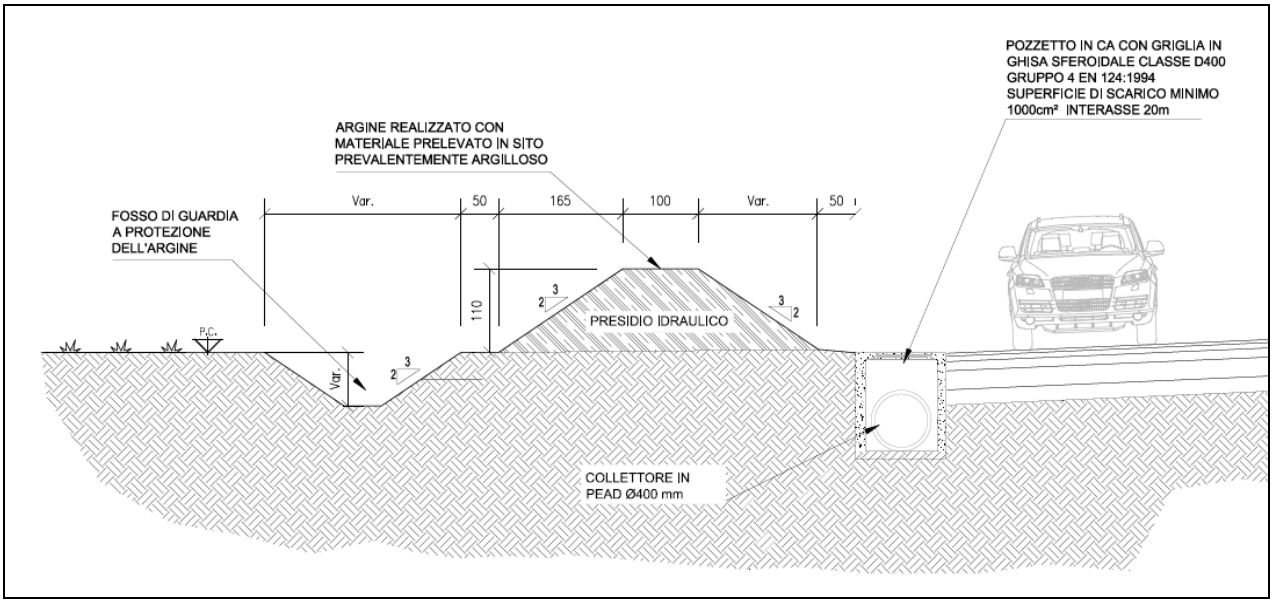


Figura 8-74: Sezione – Argine a difesa del sottovia con sistema di raccolta acque a monte del diaframma

Tale arginello si protrae oltre l'inizio della paratia di diaframmi di circa 7,0m come riportato in Figura 8-73, e si sviluppa nella direzione opposta, fino a spegnersi nel punto in cui la strada è in rilevato con un dislivello rispetto al piano campagna di 1,0m.

In corrispondenza del raccordo tra l'argine e la paratia di diaframmi è stato previsto l'inserimento di un dispositivo antisifonamento, costituito da due placche in acciaio inox AISI304 di spessore 3mm e di dimensioni 100x50cm, saldate tra loro e fissate al diaframma con 4 tasselli chimici in acciaio ≥Ø18mm di lunghezza 20cm (Figura 8-75).

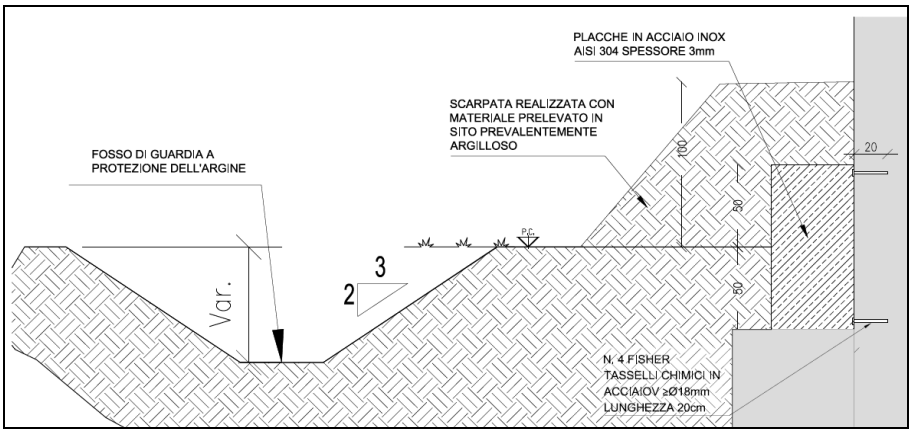


Figura 8-75: Particolare del dispositivo antisifonamento in acciaio inox

Il sistema di raccolta delle acque di piattaforma prevede che dai collettori le acque vengano convogliate alle vasche di accumulo posizionate generalmente nei punti più bassi della trincea e dei sottovia.

Il dimensionamento del sistema di accumulo delle acque viene effettuato in modo tale da garantire la sicurezza idraulica dei sottopassi anche nel caso di non funzionamento delle pompe. I fattori che influiscono sull'effetto di laminazione ed accumulo e che dunque costituiscono l'oggetto del dimensionamento sono:

- il volume massimo utile *W* del sistema di invaso;
- le caratteristiche dei dispositivi di scarico.

Il metodo delle sole piogge prevede ipotesi semplificative sia sull'onda di piena in ingresso che sulle modalità di efflusso dalla vasca. Questo metodo di dimensionamento fornisce una prima valutazione del volume di invaso della vasca sulla base della sola curva di possibilità pluviometrica e della portata massima, ipotizzata costante, che si vuole in uscita dalla vasca senza fare alcuna considerazione sulla forma dell'idrogramma. Con questa ipotesi il volume entrante nella vasca per effetto di una pioggia di durata θ risulta:

$$W_a = S \cdot \phi \cdot h(\theta) = S \cdot \phi \cdot a \cdot \theta^n$$

dove ϕ è il coefficiente d'afflusso costante del bacino drenato a monte della vasca. Nello stesso tempo θ, il volume uscito dalla vasca sarà:

$$W_e = Q_e \cdot \theta$$

Il volume invasato nel serbatoio sarà dunque:

$$W = W_a - W_e = S \cdot \phi \cdot a \cdot \theta^n - Q_e \cdot \theta$$

Il volume da assegnare alla vasca è il valore massimo W_m di questo volume che si ottiene per una precipitazione di durata θ_w critica per la vasca.

La durata θ_w è localizzata ove è massima la distanza verticale tra le due curve. Esprimendo matematicamente tale condizione di massimo si trova:

$$\theta_w = \left(\frac{Q_e}{S \cdot \phi \cdot a \cdot n} \right)^{\frac{1}{n-1}}$$

e quindi:

$$W_m = S \cdot \phi \cdot a \cdot \left(\frac{Q_e}{S \cdot \phi \cdot a \cdot n} \right)^{\frac{n}{n-1}} - Q_e \cdot \left(\frac{Q_e}{S \cdot \phi \cdot a \cdot n} \right)^{\frac{1}{n-1}}$$

Il dimensionamento della vasca di accumulo discende dal caso più critico tra i seguenti:

1) Durata di pioggia 1-2-3-6-12-24 ore con pompe in funzione;

2) Fermo pompa e generatore per 2 ore.

Si riportano di seguito i risultati ottenuti nei casi esaminati:

TABELLA 8-3: CALCOLO VOLUME DA ASSEGNARE ALLA VASCHE DI ACCUMULO

				CON SOLLEVAMENTO SEMPRE ATTIVO						CON SOLLEVAMENTO ATTIVO DOPO LE 2 ORE					
TRINCEA	**Superficie Totale sottesa**	**φ**	**Qmax impianto**	**V inv. 1h**	**V inv. 2h**	**V inv. 3h**	**V inv. 6h**	**V inv. 12h**	**V inv. 24h**	**V inv. 1h**	**V inv. 2h**	**V inv. 3h**	**V inv. 6h**	**V inv. 12h**	**V inv. 24h**
	[m²]	*[-]*	*[l/s]*	*[m³]*	*[m³]*	*[m³]*	*[m³]*	*[m³]*	*[m³]*	*[m³]*	***[m³]***	*[m³]*	*[m³]*	*[m³]*	*[m³]*
ST01 - Sottopasso Rete2	7050.00	1.00	20.00	463	507	499	435	346	305	499	**564**	535	471	418	0
ST02 - Sottopasso di via Hiroshima	8745.00	1.00	20.00	582	643	645	600	533	516	618	**700**	681	636	605	0
ST03 - Sottopasso di Pieve Modolena	8745.00	1.00	20.00	582	643	645	600	533	516	618	**700**	681	636	605	0
ST04 - Sottopasso di via K.Marx	3740.00	1.00	10.00	256	277	272	237	188	162	274	**306**	286	255	224	0
ST05 - Trincea di Corte Tegge	10550.00	1.00	20.00	738	804	810	771	708	694	774	**862**	836	807	780	0
ST06 - Sottovia di via Ferraroni	2500.00	1.00	10.00	159	171	161	118	60	24	177	**200**	179	136	96	0

Nel rispetto dei criteri collegialmente condivisi, tra tutti i casi esaminati risulta che il caso critico è rappresentato dal fermo pompa e generatore per 2 ore.

Per tale motivo il dimensionamento delle vasche di accumulo è stato fatto considerando come volume massimo invasabile quello corrispondente a due ore di fermo pompa per un tempo di ritorno di 100 anni, con un coefficiente di deflusso =1 e con un franco di sicurezza pari a 50cm.

I parametri "a" ed "n" presi in considerazione per TR100 anni sono distinti tra tratto Est e Ovest e sono indicati nella tabella seguente.

TABELLA 8-4: COEFFICIENTI DELLE LINEE SEGNALATRICI DI POSSIBILITÀ PLUVIOMETRICA PER I TRATTI EST E OVEST

Tratto	**T_R anni**	**n**	**a**
EST	100	70.72	0.179

OVEST	100	73.33	0.156

Nella tabella seguente sono riportati i valori dei volumi di invaso delle vasche di accumulo per singolo sottovia/trincea, al netto del franco di 50cm:

TABELLA 8-5: VOLUMI DELLE VASCHE DI ACCUMULO – DURATA CRITICA 2H

Trincea o Sottopasso	Superficie	Φ	Volume
	[m²]	[-]	[m³]
ST01 - Sottopasso Rete2	7050.00	1.00	565
ST02 - Sottopasso di via Hiroshima	8745.00	1.00	700
ST03 – Sottopasso di Pieve-Modolena	8745.00	1.00	700
ST04 – Sottopasso di via K.Marx	3740.00	1.00	310
ST05 - Trincea di Corte Tegge	10550.00	1.00	865
ST06 - Sottovia di via Ferraroni	2500.00	1.00	200

Nel calcolo delle superfici sottese, ove il displuvio, in ingresso ed in uscita dal sottovia/trincea, non è ben definito, si è tenuto conto del contributo di una parte di carreggiata compresa tra l'inizio della paratia di diaframmi ed il primo displuvio ben definito ed esistente. In questa ipotesi cautelativa si considera che il 30% del volume di pioggia scolante di questa area confluisca all'interno della vasca di accumulo mentre il restante 70% venga fatto confluire nei fossi di guardia. Per avvalorare quest'ipotesi, nei tratti in questione è stato dimezzato il passo degli embrici in modo da facilitare lo scarico nei fossi di guardia.

Le acque dalla vasche di accumulo proseguono il loro percorso verso l'impianto di sollevamento, ad eccezione della trincea di Corte Tegge in cui, a monte del sollevamento, è previsto il trattamento attraverso un apposito impianto di depurazione, come riportato nell'immagine seguente.

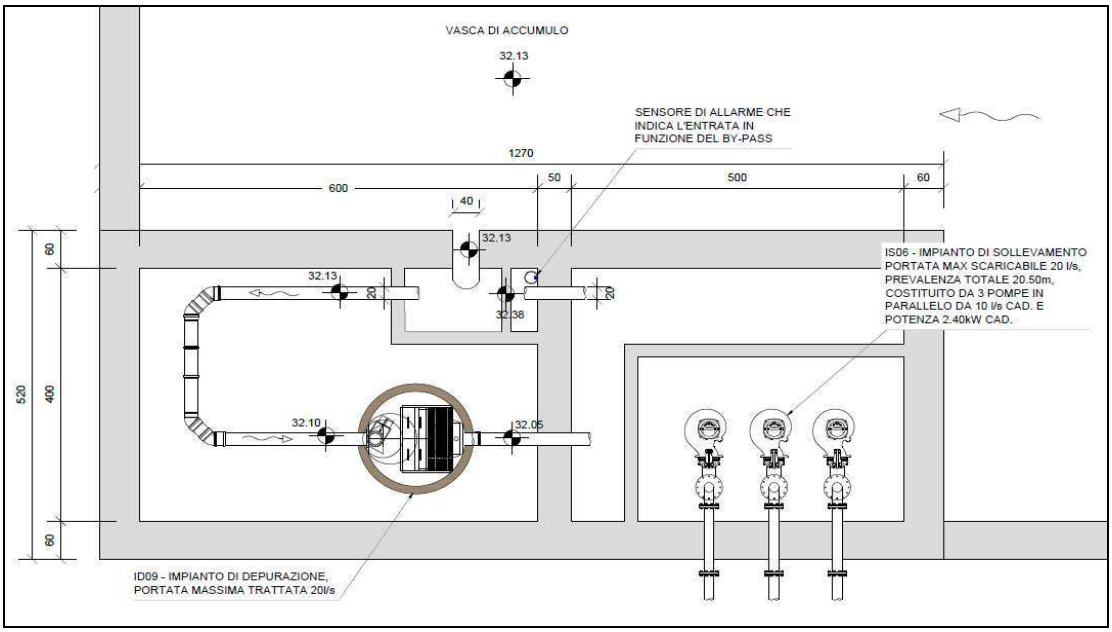


Figura 8-76: Schema di flusso da Vasca di Accumulo a stazione di sollevamento nella trincea di Corte Tegge

L'impianto di depurazione è dotato di bypass per ovviare ai casi critici e un sensore di allarme ne indica l'entrata in funzione.

L'impianto di sollevamento, nel caso della trincea di Corte Tegge, è costituito da 3 pompe; di queste 2 sono in funzione in modo tale da gestire adeguatamente le piogge ordinarie (TR inferiore a 100 anni), mentre la terza entra in funzione o per casi eccezionali (TR≥100 anni) o per consentire l'ordinaria manutezione di una delle due precedenti. Per i Sottovia, l'impianto di sollevamento è costituito da 2 o 3 pompe, ed il criterio di funzionamento e turnazione è il medesimo di quello appena descritto per la trincea.

Il dimensionamento dell'impianto di sollevamento dipende dalla portata che può essere evacuata e scaricata all'interno del corso d'acqua recettore e dalla prevalenza da assegnare alle pompe, calcolata in base al salto geodetico e alle perdite di carico distribuite e concentrate, attraverso l'equazione seguente:

$$\Delta H = L \cdot J + \sum P_c$$

dove ΔH indica la differenza tra i carichi totali di monte e di valle della condotta, J indica la cadente idraulica e ΣP_c indica la somma delle perdite di carico concentrate presenti lungo la condotta e dovute a curve, saracinesche, ecc..

Nelle tabelle seguenti si mostra il dimensionamento degli impianti di sollevamento.

TABELLA 8-6: DIMENSIONAMENTO IMPIANTO DI SOLLEVAMENTO IS_01 – SOTTOPASSO RETE 2

	Superficie Totale	φ	V invaso senza impianto di sollevamento	Portata max da smaltire	Tempo di smaltimento	Volume da sollevare se non funzionamento pompe per 2h	Tempo di smaltimento del volume eccedente	Tipo di impianto
	[m²]	*[-]*	*[m³]*	*[m³/s]*	*[h]*	*[m³]*	*[h]*	**COD. IS_01**

Tp 1 ora	7050.00	1.00	499	0.020	6.92	-	-	N 3085 SH/MT 1+1+1 POMPE CON PREVALENZA 16.50m E PORTATA 10l/s CAD. - POTENZA 2,4 kW – $L_{TUBI\ SCARICO}$=40m
Tp 2 ore	7050.00	1.00	**564**	0.020	7.84	-	-	
Tp 3 ore	7050.00	1.00	607	0.020	8.43	42	0.59	
Tp 6 ore	7050.00	1.00	687	0.020	9.54	123	1.70	
Tp 12 ore	7050.00	1.00	778	0.020	10.80	213	2.96	
Tp 24 ore	7050.00	1.00	881	0.020	12.23	316	4.39	

TABELLA 8-7: DIMENSIONAMENTO TIPO DI IMPIANTO DI SOLLEVAMENTO – IS_07 – SOTTOPASSO DI VIA HIROSHIMA

	Superficie Totale	φ	**V invaso senza impianto di sollevamento**	**Portata max da smaltire**	**Tempo di smaltimento**	**Volume da sollevare se non funzionamento pompe per 2h**	**Tempo di smaltimento del volume eccedente**	**Tipo di impianto**
	[m²]	*[-]*	*[m³]*	*[m³/s]*	*[h]*	*[m³]*	*[h]*	**COD. IS_07**
Tp 1 ora	8745.00	1.00	618	0.020	8.59	-	-	N3085 SH/MT 1+1+1 POMPE CON PREVALENZA 12.50m E PORTATA 10l/s CAD.- POTENZA 2,4 Kw – $L_{TUBI\ SCARICO}$=30m
Tp 2 ore	8745.00	1.00	**700**	0.020	9.72	-	-	
Tp 3 ore	8745.00	1.00	753	0.020	10.46	53	0.73	
Tp 6 ore	8745.00	1.00	852	0.020	11.84	152	2.11	
Tp 12 ore	8745.00	1.00	965	0.020	13.40	265	3.68	
Tp 24 ore	8745.00	1.00	1092	0.020	15.17	392	5.45	

TABELLA 8-8: DIMENSIONAMENTO TIPO DI IMPIANTO DI SOLLEVAMENTO – IS_02 – SOTTOPASSO PIEVE-MODOLENA

	Superficie Totale	φ	**V invaso senza impianto di sollevamento**	**Portata max da smaltire**	**Tempo di smaltimento**	**Volume da sollevare se non funzionamento pompe per 2h**	**Tempo di smaltimento del volume eccedente**	**Tipo di impianto**
	[m²]	*[-]*	*[m³]*	*[m³/s]*	*[h]*	*[m³]*	*[h]*	**COD. IS_02**
Tp 1 ora	8745.00	1.00	618	0.020	8.59	-	-	N 3085 SH/MT 1+1+1 POMPE CON PREVALENZA 11,50 m E PORTATA 10 l/s CAD. - POTENZA 2,4 Kw – $L_{TUBI\ SCARICO}$=40m
Tp 2 ore	8745.00	1.00	**700**	0.020	9.72	-	-	
Tp 3 ore	8745.00	1.00	753	0.020	10.46	53	0.73	
Tp 6 ore	8745.00	1.00	852	0.020	11.84	152	2.11	
Tp 12 ore	8745.00	1.00	965	0.020	13.40	265	3.68	
Tp 24 ore	8745.00	1.00	1092	0.020	15.17	392	5.45	

TABELLA 8-9: DIMENSIONAMENTO TIPO DI IMPIANTO DI SOLLEVAMENTO – IS_03 – SOTTOPASSO DI VIA K.MARX

	Superficie Totale	φ	**V invaso senza impianto di sollevamento**	**Portata max da smaltire**	**Tempo di smaltimento**	**Volume da sollevare se non funzionamento pompe per 2h**	**Tempo di smaltimento del volume eccedente**	**Tipo di impianto**
	[m²]	*[-]*	*[m³]*	*[m³/s]*	*[h]*	*[m³]*	*[h]*	**COD. IS_03**
Tp 1 ora	3740.00	1.00	274	0.010	7.62	-	-	N 3085 SH/MT 1+1 POMPE CON PREVALENZA 9,50m E PORTATA 10l/s CAD. - POTENZA 2.4 kW – $L_{TUBI\ SCARICO}$=26m
Tp 2 ore	3740.00	1.00	**306**	0.010	8.49	-	-	
Tp 3 ore	3740.00	1.00	326	0.010	9.04	20	0.55	
Tp 6 ore	3740.00	1.00	363	0.010	10.07	57	1.59	
Tp 12 ore	3740.00	1.00	404	0.010	11.23	99	2.74	
Tp 24 ore	3740.00	1.00	450	0.010	12.51	145	4.02	

TABELLA 8-10: DIMENSIONAMENTO TIPO DI IMPIANTO DI SOLLEVAMENTO – IS_06 – TRINCEA DI CORTE TEGGE

	Superficie Totale	φ	V invaso senza impianto di sollevamento	Portata max da smaltire	Tempo di smaltimento	Volume da sollevare se non funzionamento pompe per 2h	Tempo di smaltimento del volume eccedente	Tipo di impianto
	[m²]	*[-]*	*[m³]*	*[m³/s]*	*[h]*	*[m³]*	*[h]*	**COD. IS_06**
Tp 1 ora	10550.00	1.00	774	0.020	10.74	-	-	N 3085 SH/MT 1+1+1 POMPE CON PREVALENZA 20,50m E PORTATA 10l/s CAD. - POTENZA 2.4 kW – $L_{TUBI\ SCARICO}$=150m
Tp 2 ore	10550.00	1.00	**862**	0.020	11.97	-	-	
Tp 3 ore	10550.00	1.00	918	0.020	12.75	56	0.78	
Tp 6 ore	10550.00	1.00	1023	0.020	14.21	161	2.24	
Tp 12 ore	10550.00	1.00	1140	0.020	15.83	278	3.86	
Tp 24 ore	10550.00	1.00	1270	0.020	17.64	408	5.67	

TABELLA 8-11: DIMENSIONAMENTO TIPO DI IMPIANTO DI SOLLEVAMENTO – IS_09 – SOTTOPASSO DI VIA FERRARONI

	Superficie Totale	φ	V invaso senza impianto di sollevamento	Portata max da smaltire	Tempo di smaltimento	Volume da sollevare se non funzionamento pompe per 2h	Tempo di smaltimento del volume eccedente	Tipo di impianto
	[m²]	*[-]*	*[m³]*	*[m³/s]*	*[h]*	*[m³]*	*[h]*	**COD. IS_09**
Tp 1 ora	2500.00	1.00	177	0.010	4.91	-	-	N 3085 SH/MT 1+1 POMPE CON PREVALENZA 8,50m E PORTATA 10l/s CAD. - POTENZA 2.4 kW – $L_{TUBI\ SCARICO}$=10m
Tp 2 ore	2500.00	1.00	**200**	0.010	5.56	-	-	
Tp 3 ore	2500.00	1.00	215	0.010	5.98	15	0.42	
Tp 6 ore	2500.00	1.00	244	0.010	6.77	43	1.21	
Tp 12 ore	2500.00	1.00	276	0.010	7.66	76	2.10	
Tp 24 ore	2500.00	1.00	312	0.010	8.67	112	3.11	

Il Sottopasso ST07 denominato Roncocesi, perché in affiancamento alla Fossetta Valle Roncocesi, è stato studiato in maniera differente rispetto agli altri casi precedenti, in quanto si tratta di un sottopasso poderale di modeste dimensioni, con funzione di passaggio per mezzi agricoli e di accesso all'area interclusa tra la tangenziale e la Ferrovia MI-BO, dove è presente una sola abitazione, Casa Gallinari. In questo caso è previsto l'inserimento di un sistema di collettori del Φ400 in PeAD SN8 e di una vasca di accumulo con volume pari a 20 m³ . La stazione di sollevamento IS_10 è costituita da due pompe N3085 SH/MT con portata pari a 10l/s cad., prevalenza 6.50m e potenza 2.4kW/cad.

8.1. INVASI DI LAMINAZIONE

Il processo laminativo delle acque generate dalla piattaforma stradale, viene garantito, oltre che dai fossi di guardia, come argomentato nel paragrafo 8.2.1, anche, talvolta, da un invaso di laminazione ricavato o in aree marginali, delimitate dalla viabilità in progetto, o in aree di riqualificazione ambientale.

TABELLA 8-12: ELENCO INVASI DI LAMINAZIONE CON LE PRINCIPALI CARATTERISTICHE

Codice	Corso d'acqua recettore	Superficie utile invaso [m²]	Volume max di invaso [m³]	Quota di scarico a gravità [m slm]	Quota di massimo invaso [m slm]	Quota terreno [m slm]
INV_01	CAVO GUAZZATORE	4400	2800	43.45	44.09	44.60
INV_02	FOSSETTA VALLE PIEVE MODOLENA	2500	1650	40.25	41.00	41.55
INV_03	FOSSETTA VALLE PIEVE MODOLENA	3500	2100	39.65	40.50	41.00
INV_04	FOSSETTA VALLE RONCOCESI	3000	2300	40.18	40.94	41.40
INV_05	TORRENTE QUARESIMO	1100	1035	40.68	41.62	42.12
INV_06	FOSSETTA SAN GIULIO	4500	2900	45.00	45.65	45.80

Lo scopo di queste vasche è quello di invasare le acque generate dalla piattaforma stradale al fine di scaricarle, previa depurazione, in modo controllato nei corsi d'acqua recettori.

Come i fossi di guardia, anche le vasche sono state dimensionate considerando eventi pluviometrici con TR=50anni e garantendo sempre un certo franco di sicurezza, variabile tra i 15 e i 55cm, dalla quota massima d'invaso alla sommità del ciglio spondale.

Gli invasi sono collegati ai fossi di guardia con tombini circolari in CA; il loro fondo presenta delle savanelle in grado di smaltire le portate di magra inoltre, è sempre garantita una certa pendenza che permette alle acque di defluire verso lo scarico, evitando il ristagno.

Tutte le vasce previste, tranne l'invaso INV_01, ricadono in aree classificate da media ad elevata vulnerabilità dell'acquifero, quindi per queste occorre prevedere un rivestimento del fondo con materassino bentonitico ricoperto con 20cm di terreno vegetale.

Negli elaborati grafici P00ID00IDRI01A-2A-3A, sono riportati tutti i particoalri di dettaglio degli invasi di laminazione previsti.

8.2. CONTROLLO DEGLI SVERSAMENTI ACCIDENTALI

La gestione delle emergenze dovute a eventuali sversamenti accidentali ed inquinanti sulla piattaforma della tangenziale è resa possibile attraverso l'interruzione del flusso idrico diretto al recettore finale. Questo è reso possibile abbassando completamente l'organo di regolazione costituito da una paratoia monosettore regolabile manualmente con volantino, posta all'interno del pozzetto prefabbricato in CA che si trova immeditamente a monte dell'impianto di depurazione (Figura 8-77).

In caso di evento accidentale, il personale di pronto intervento deve abbassare completamente la paratoia isolando l'inquinante all'interno dei fossi di guardia e nella vasca di laminazione, dopodichè si procede con la bonifica fatta direttamente dagli autospurghi, operanti dalla strada.

Nel caso di sversamento accidentale sui ponti e viadotti, il sistema di raccolta e smaltimento delle acque previsto, consente di convogliare l'inquinante verso il fosso di guardia senza rischio di dilavamento nei corsi d'acqua attraversati.

Nel caso della Trincea di Corte Tegge il controllo degli sversamenti accidentali avviene mediante la regolazione della valvola di emergenza, posta al piede del rilevato arginale. Questa è dotata di volantino, che consente al personale di pronto intervento di interrompere il flusso idrico evitando lo sversamento all'interno della Fossetta della Torretta (Figura 8-78).

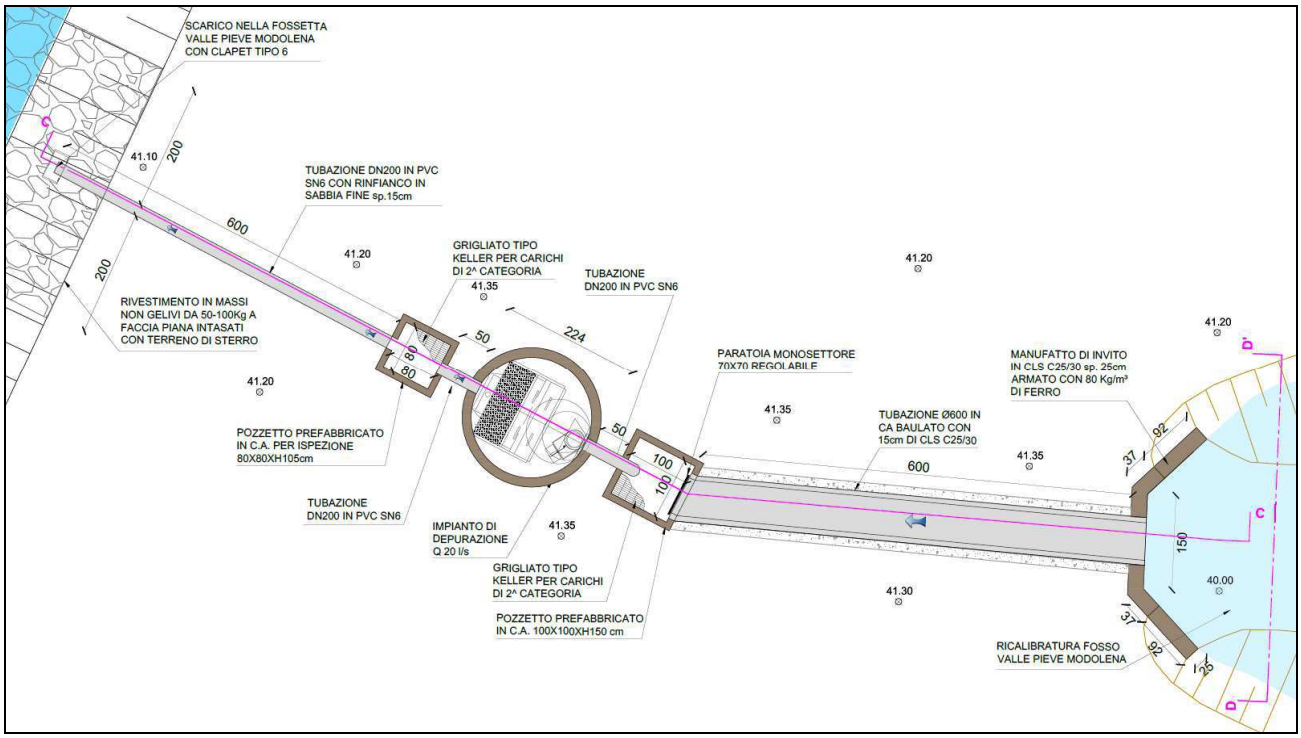


Figura 8-77: Particolare di un impianto di depurazione comprensivo di paratoia per gli sversamenti accidentali

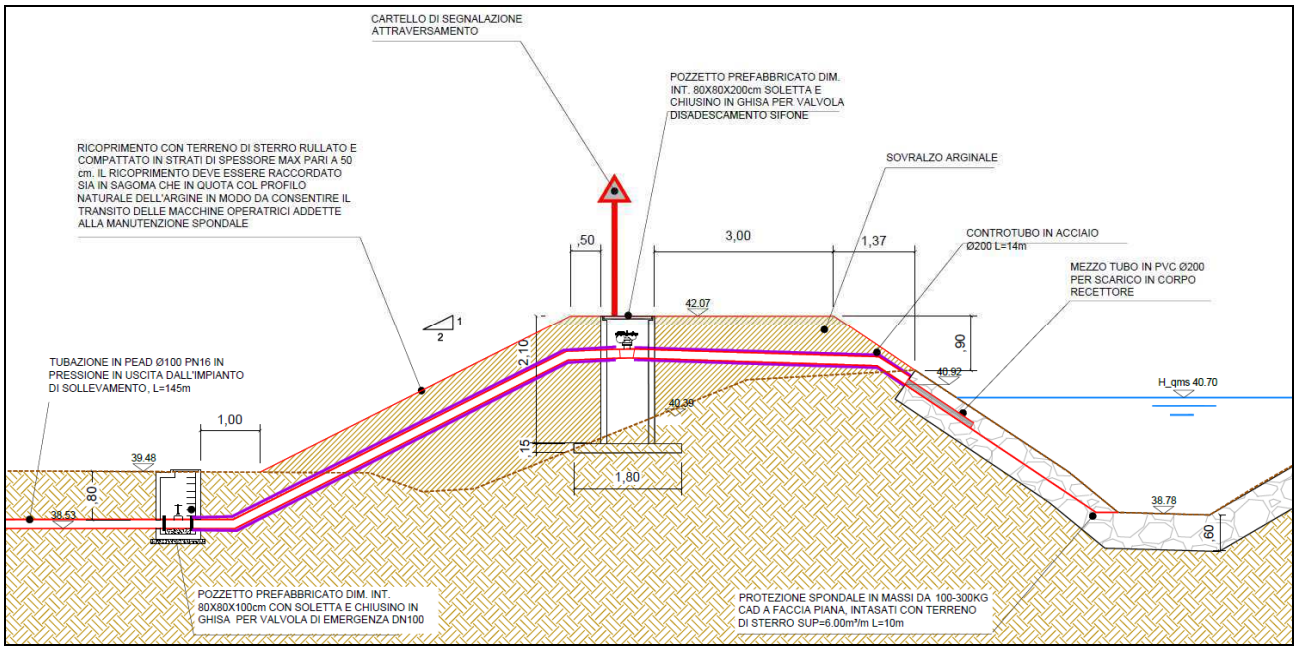


Figura 8-78: Particolare dello scarico nella Fossetta della Torretta, comprensivo di valvola d'emergenza per sversamenti accidentali

9. TRATTAMENTO DELLE ACQUE DI PIATTAFORMA

Il presente capitolo ha l'intento di descrivere le caratteristiche del sistema di depurazione in continuo, pensato per la laminazione e quindi il trattamento di tutte le acque meteoriche sia quelle di prima che di seconda pioggia, scolanti dalla piattaforma stradale fino ad una intensità di pioggia per TR=50 anni.

9.1. IMPIANTI DI TRATTAMENTO IN CONTINUO

Le acque di piattaforma, ovvero le acque drenate sulla sede stradale, devono essere smaltite attraverso un sistema idraulico che realizza le fasi d'evacuazione, laminazione, depurazione e scarico delle portate raccolte nel rispetto delle normative cogenti.

In Figura 9-1 viene riportato lo schema funzionale del sistema in continuo per il trattamento delle acque di piattaforma nel caso in cui si scarica in un corpo idrico recettore a raso.

Tale sistema è costituito da più manufatti, tra questi vi è un manufatto di invito in CA che ha la funzione di incanalare l'acqua presente nei fossi di guardia o nella vasca di laminazione indirizzandola verso l'impianto di trattamento. Da qui parte una tubazione di carico in CA Ø600 baulata in cls che veicola l'acqua verso il trattamento.

A monte dell'impianto di depurazione è previsto un pozzetto prefabbricato in CA ispezionabile, munito di paratoia monosettore regolabile per bloccare gli sversamenti accidentali. Oltre alla paratoia e presente un modulatore, costituito da un tubo in PVC SN6 variabile da Ø200mm a Ø315mm, che regola la portata in ingresso nell'impiantoe quindi allo scarico finale. La scelta del diametro deriva dal limite di scarico da rispettare, tale vincolo condiziona inevitabilmente la scelta dell'impianto di depurazione vero e proprio.

Il manufatto principale che costituisce il sistema di trattamento è costituito da una vasca di trattamento in grado di trattenere i solidi sospesi e gli oli, attraverso un semplice processo combinato di sedimentazione e filtrazione. Il manufatto è perfettamente ispezionabile poiché nella parte superiore sono presenti due botole con chiusino in ghisa sferoidale removibili per la manutenzione.

Il funzionamento della vasca è il seguente: l'acqua inquinata entra in un sedimentatore di testa attraverso un primo sistema di limitazione e chiusura automatica a galleggiante che evita il rigurgito di oli. Grazie al basso carico superficiale ed al lungo percorso, l'acqua passa da un moto turbolento a un moto laminare permettendo così una corretta separazione delle sostanze sedimentabili. Successivamente, grazie ad un percorso obbligato, l'acqua ancora inquinata attraversa i pacchetti lamellari dove le gocce d'olio più grandi vengono rapidamente indirizzate verso la superficie, mentre quelle più piccole vengono catturate grazie alla funzione coalescente e rilasciate solo una volta raggiunta la giusta dimensione.

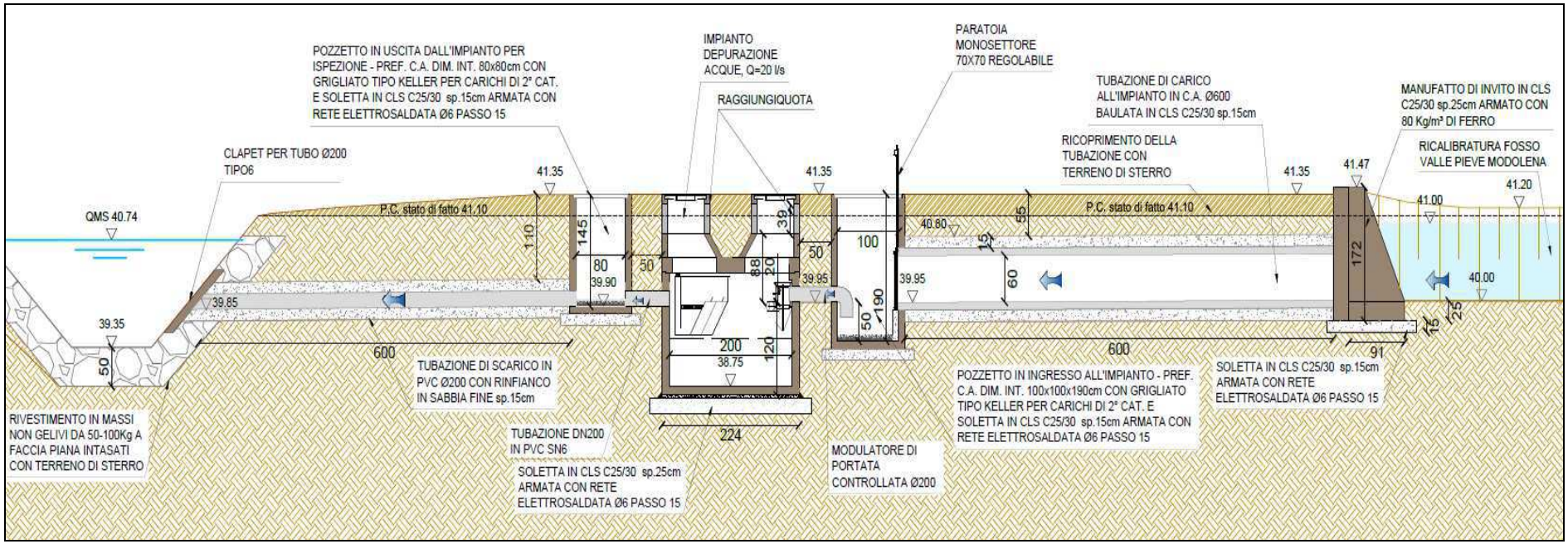


Figura 9-1:Schema del sistema di trattamento in continuo delle acque di piattaforma nel caso di corso d'acqua recettore a raso

Gli oli ormai separati vengono trattenuti in superficie e l'acqua viene incanalata nel condotto di scarico diretti verso il corpo idrico recettore.

Al termine del trattamento l'acqua viene convogliata in un pozzetto prefabbricato in CA ispezionabile per consentire ai tecnici ARPA di effettuare i controlli sulla qualità delle acque scaricate.

A valle di questo pozzetto è presente una tubazione in PVC SN6 variabile da Ø200mm a Ø315mm e di lunghezza minima pari a 6.0m, che consente di scaricare nel corpo idrico recettore. In tutti i casi, tranne che per i corsi d'acqua arginati e per il Torrente Modolena in cui la quota di scarico è più alta del livello idrico derivante da una portata bisecolare, è necessario prevedere una valvola clapet al termine della tubazione di scarico, che consente di evitare indesiderati rigurgiti.

In Figura 9-2 viene riportato lo schema funzionale del sistema di depurazione in continuo per il trattamento delle acque di piattaforma nel caso in cui si scarica, previo sollevamento, in un corpo idrico recettore arginato.

Nel caso in oggetto l'acqua in uscita dall'impianto di depurazione viene fatta confluire prima nel pozzetto di ispezione e poi nella cameretta in CA, dimensioni interne 300x150cm, che accoglie l'impianto di sollevamento. Lo scarico nel corso d'acqua arginato avviene mediante una tubazione in PeAD Ø100 PN16 con controtubo in acciaio Ø200.

Di seguito è riportata la tabella riassuntiva degli impianti di sollevamento previsti nel caso di scarico in corsi d'acqua arginati

TABELLA 9-1: IMPIANTI DI SOLLEVAMENTO PER SCARICO ACQUE DI PIATTAFORMA IN CORSI D'ACQUA ARGINATI

Codice	Corso d'acqua recettore	Massima portata smaltibile [l/s]	Numero di pompe in parallelo da 10 l/s cad.	Quota di max elevazione geodetica [m slm]	Prevalenza [m]	Potenza singola pompa [kW]	Diametro tubo di scarico [mm]	Lunghezza tubo di scarico [m]
IS_04	TORRENTE QUARESIMO	10	2	43.50	6.50	2.40	100	30
IS_05	FOSSETTA DELLA TORRETTA	10	2	40.67	5.00	2.40	100	30
IS_08	TORRENTE CROSTOLO	20	2	50.90	7.50	2.40	100	25

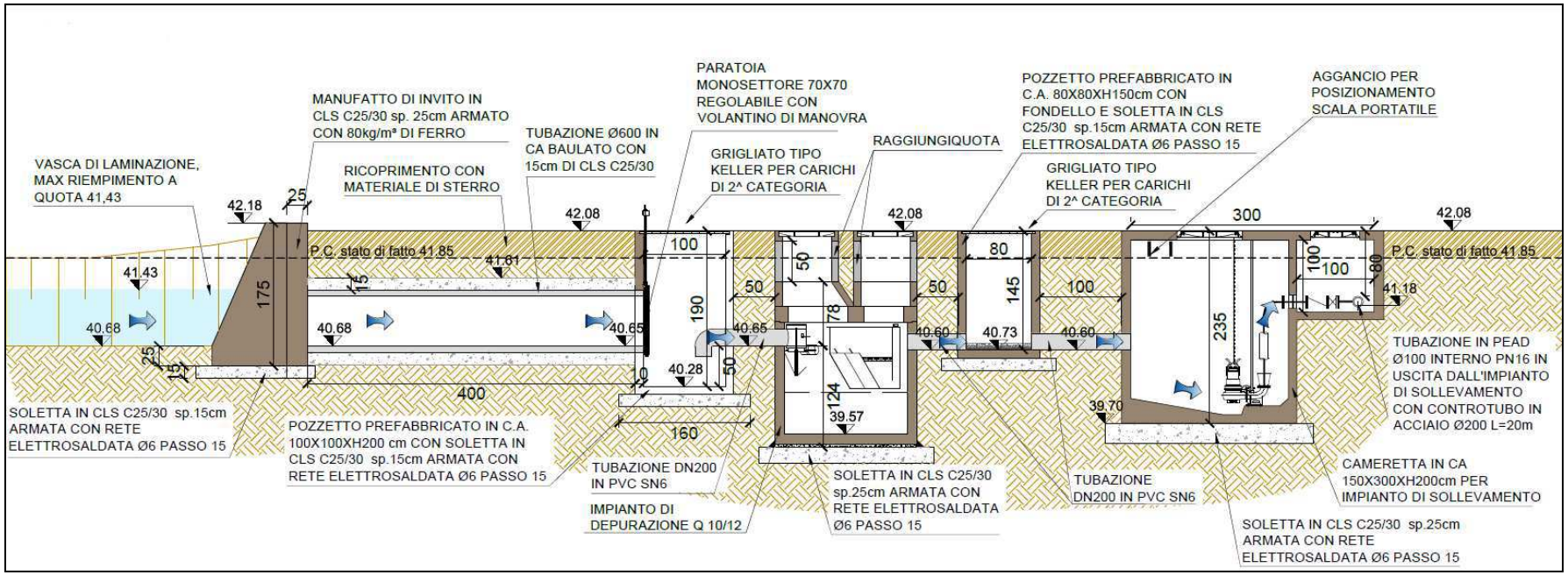


Figura 9-2: Schema del sistema di trattamento in continuo delle acque di piattaforma nel caso di corso d'acqua recettore argianto (torrente Quaresimo)

Il trattamento in continuo dell'impianto di depurazione, nel pieno rispetto di quanto imposto dalle Normative cogenti, permette, attraverso la separazione gravimetrica dei solidi sospesi e attraverso l'utilizzo di filtri a coalescenza per la separazione degli oli, la mitigazione dello sversamento, con un abbattimento delle sostanze inquinanti superiore rispetto ai sistemi di prima pioggia con accumulo.

Di seguito si riporta la pianta e la sezione di un impianto tipo per il trattamento delle acque di piattaforma in continuo.

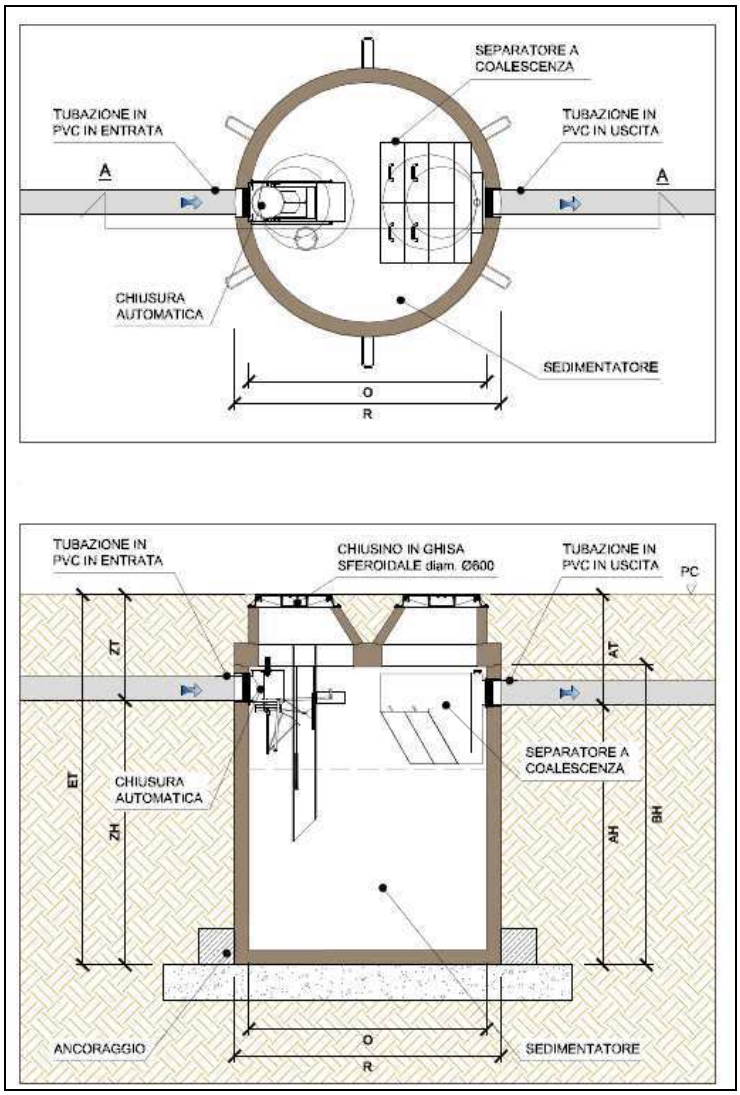


Figura 9-3:Schema tipo di un impianto di trattamento in continuo delle acque di piattaforma

Il sistema di trattamento in continuo non presenta capacità di invaso in quanto la portata in uscita risulta coincidente con la portata in entrata. Questa viene garantita a monte da apposito impianto di laminazione costituito dal madolutore precedentemente descritto. Per questi impianti di trattamento è prevista la manutenzione periodica con relativo smaltimento dei residui inquinanti trattenuti. Per quanto riguarda la manutenzione gli impianti dovranno essere controllati visivamente una volta al mese e il controllo dovrà includere: controllo del livello d'olio nella zona di separazione; controllo delle piastre filtranti; controllo e

pulizia del galleggiante nella chiusura automatica; controllo del livello del fango nel sedimentatore e asportazione di questo nel caso in cui il fango occupi più dei ¾ della sezione del sedimentatore; pulizia dei pacchetti piastre lamellari (ogni 5 anni). Infine, con cadenza circa annuale, devono essere rimossi dalle vasche (da parte di ditte specializzate) gli oli in sospensione e le sabbie depositate. Medesima cadenza deve essere prevista per i filtri a coalescenza, la cui manutenzione prevede il lavaggio del filtro o la sostituzione.

Il trattamento delle acque di piattaforma prevede l'inserimento di 11 impianti di depurazione distribuiti lungo tutto il percorso della tangenziale. Le piazzole tecnologiche sono situate in prossimità dei corsi d'acqua recettori e sono rese accessibili ai fini della manutenzione tramite piste esterne. Nei casi in cui si è ritenuto necessario è previstia una recinzione con cancello di accesso, per proteggere gli impianti da eventuali atti vandalici.

Di seguito si riporta una tabella riepilogativa di tutti gli impianti di trattamento con le principali caratteristiche.

Tabella 9-2:Impianti di trattamento in continuo presenti lungo il tracciato stradale

Codice	Corso d'acqua recettore	Portata massima trattata [l/s]	Lunghezza tubo in entrata [m]	Lunghezza tubo in uscita [m]	Quota scarico impianto [m slm]	Diametro tubo in entrata [mm]	Diametro tubo in uscita [mm]	Presenza di clapet allo scarico
ID_01	FOSSETTA S.GIULIO	16	0.50	0.50	44.70	200	200	SI
ID_02	CAVO GUAZZATORE	14	0.50	0.50	43.00	200	200	SI
ID_03	FOSSETTA VALLE PIEVE MODOLENA	20	0.50	0.50	39.85	200	200	SI
ID_04	FOSSETTA VALLE PIEVE MODOLENA	16	0.50	0.50	39.50	200	200	SI
ID_05	FOSSETTA VALLE RONCOCESI	20	0.50	0.50	39.45	200	200	SI
ID_06	FOSSETTA VALLE RONCOCESI	30	0.50	0.50	40.05	315	315	SI
ID_07	TORRENTE QUARESIMO	10	0.50	0.50	40.60	200	200	NO
ID_08	FOSSETTA DELLA TORRENTTA	10	0.50	0.50	38.30	200	200	NO
ID_09	FOSSETTA DELLA TORRETTA	20	0.50	0.50	32.05	200	200	NO
ID_10	TORRENTE CROSTOLO	20	0.50	0.50	47.95	200	200	NO
ID_11	TORRENTE MODOLENA	40	0.50	0.50	43.25	315	315	NO

10. VALUTAZIONE DELLA CAPACITA' DEL RECETTORE

La realizzazione degli interventi in progetto comporta una serie di verifiche, volte ad indagare gli effetti indotti dalle nuove opere sul regime idraulico dei corsi d'acqua in cui è previsto lo scarico delle acque generate dalla piattaforma stradale. Scopo della presente analisi è quello di accertare la compatibilità idraulica degli interventi, in termini di valutazione della capacità del recettore di smaltire la portata conferita senza alterare in modo significativo le sue caratteristiche idrauliche e le condizioni di sicurezza idraulica del territorio a valle dell'infrastruttura.

A tale proposito, si precisa che la verifica della compatibilità idraulica dei corsi d'acqua è stata condotta, verificando che l'incremento di portata dovuto all'impermeabilizzazione della piattaforma stradale non risulti significativo, in particolare non superi il 10% della portata di progetto, rappresentata dalla portata massima sostenibile del canale o dalla portata bisecolare per i torrenti Crostolo, Modolena e Quaresimo. Inoltre, lo studio è volto ad accertare che non vi siano incrementi significativi del grado di riempimento degli attraversamenti stradali in progetto ed esistenti.

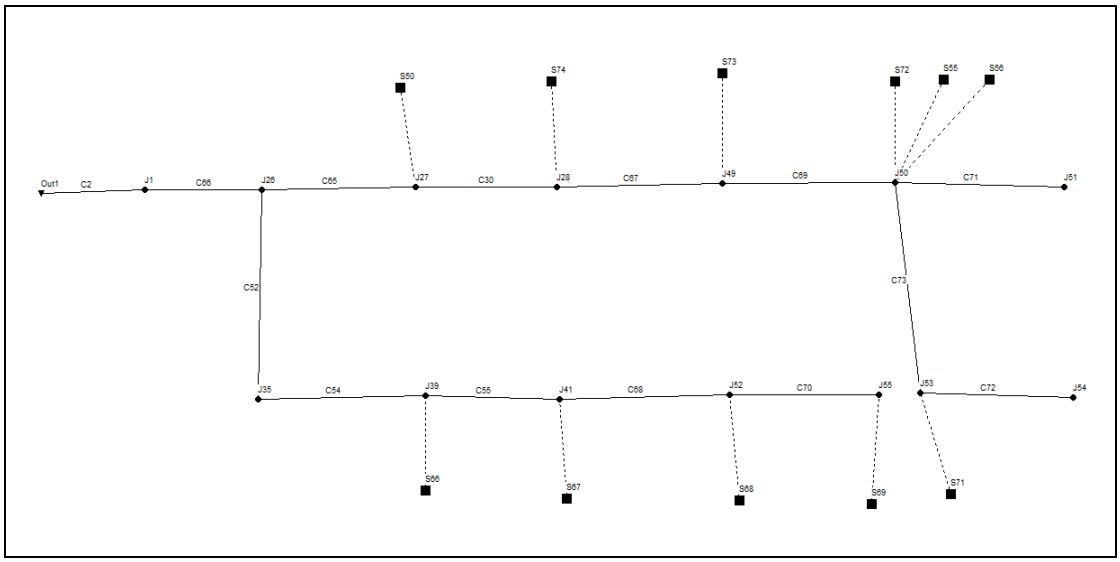
Nella tabella seguente sono riportate, per ciascun corso d'acqua recettore, le portate di progetto (Q_{MS} e Q_{200}) e le portate generate dalla piattaforma stradale e scaricate previa depurazione. Come si può notare l'incremento percentuale è sempre decisamente inferiore al 10%. Nella *"Relazione Idrologica Idraulica sulla gestione delle interferenze idrauliche" (cod. P00ID00IDRRE01A),* sono riportate le verifiche sugli eventuali incrementi del grado di riempimento degli attraversamenti stradali in progetto ed esistenti in cui è dimostrato che questi, quando presenti, sono impercettibili.

TABELLA 10-1: PERCENTUALE DI INCREMENTO DI PORTATA CIRCOLANTE NEL CANALE RECETTORE

Corso d'acqua Recettore	Portata di progetto (Q_{prog})	Portata di scarico (Qsc)	Qsc /Q_{prog}
	[m³/s]	[m³/s]	[%]
TORRENTE CROSTOLO	270.00	0.020	0.007
FOSSETTA SAN GIULIO	0.60	0.016	2.670
FOSSETTA BARATTO	0.55	0.020	3.630
FOSSETTA GIANFERRARI	0.33	0.020	6.060
CAVO GUAZZATORE	9.00	0.014	0.156
FOSSETTA CASTELLARA	3.50	0.020	0.570
FOSSETTA VALLE PIEVE MODOLENA	4.70	0.046	0.980
FOSSETTA VALLE RONCOCESI	1.80	0.070	3.900
TORRENTE MODOLENA	93.00	0.040	0.040
TORRENTE QUARESIMO	66.50	0.010	0.015
FOSSETTA DELLA TORRETTA	7.50	0.030	0.400

ALLEGATO 1: RISULTATI DIMENSIONAMENTO FOSSI DI GUARDIA E TOMBINI DI COLLEGAMENTO

TORRENTE CROSTOLO



- Durata 2h – T_R50anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
  **********************************************************
  NOTE: The summary statistics displayed in this report are
  based on results found at every computational time step,
  not just on results from each reporting time step.
  **********************************************************
  ***************
  Analysis Options
  ***************
  Flow Units ............... LPS
  Process Models:
    Rainfall/Runoff ........ YES
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ YES
    Water Quality .......... NO
  Infiltration Method ...... CURVE_NUMBER
  Flow Routing Method ...... DYNWAVE
  Starting Date ............ OCT-31-2012 00:00:00
  Ending Date .............. NOV-04-2012 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:01:00
  Wet Time Step ............ 00:00:30
  Dry Time Step ............ 00:01:00
  Routing Time Step ........ 30.00 sec
  **************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m           mm
  **************************     ---------       -------
  Total Precipitation ......         0.051        71.550
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.008        10.734
  Surface Runoff ...........         0.042        59.775
  Final Surface Storage ....         0.001         1.045
  Continuity Error (%) .....         0.000
  **************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************     ---------      ---------
```

```
  Dry Weather Inflow .....        0.000        0.000
  Wet Weather Inflow .....        0.042        0.423
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow .............       0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.042        0.421
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.524
  ***************************
  Time-Step Critical Elements
  ***************************
  Link C2 (82.81%)
  *********************************
  Highest Flow Instability Indexes
  *********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     0.50 sec
  Average Time Step           :     5.62 sec
  Maximum Time Step           :    30.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
  ***************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                        Total     Total     Total     Total     Total     Total     Peak  Runoff
                       Precip     Runon      Evap      Infil    Runoff    Runoff    Runoff   Coeff
  Subcatchment            mm        mm        mm        mm        mm    10^6 ltr     LPS
  ---------------------------------------------------------------------------------------------------
  S50                   71.55      0.00      0.00      3.37     67.20      0.03     8.17   0.939
  S55                   71.55      0.00      0.00     35.00     35.29      0.03    10.71   0.493
  S56                   71.55      0.00      0.00     45.46     24.82      0.01     2.91   0.347
  S66                   71.55      0.00      0.00      3.37     67.20      0.03     8.17   0.939
  S67                   71.55      0.00      0.00      3.37     67.20      0.03     8.17   0.939
  S68                   71.55      0.00      0.00      3.37     67.20      0.03     8.17   0.939
  S69                   71.55      0.00      0.00      3.37     67.20      0.03     8.17   0.939
  S71                   71.55      0.00      0.00     35.74     34.54      0.01     2.68   0.483
  S72                   71.55      0.00      0.00      3.37     67.20      0.17    45.52   0.939
  S73                   71.55      0.00      0.00      3.37     67.20      0.03     8.17   0.939
  S74                   71.55      0.00      0.00      3.37     67.20      0.03     8.17   0.939
  ******************
  Node Depth Summary
  ******************
  -----------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -----------------------------------------------------------------------
  J1            JUNCTION     0.36     0.84    48.79     0  01:56
  J26           JUNCTION     0.33     0.79    48.79     0  01:56
  J27           JUNCTION     0.33     0.78    48.79     0  01:56
  J28           JUNCTION     0.32     0.77    48.79     0  01:56
  J35           JUNCTION     0.32     0.77    48.79     0  01:56
  J39           JUNCTION     0.31     0.76    48.79     0  01:56
  J41           JUNCTION     0.30     0.75    48.79     0  01:56
  J49           JUNCTION     0.32     0.76    48.79     0  01:56
  J50           JUNCTION     0.31     0.75    48.79     0  01:56
  J51           JUNCTION     0.28     0.71    48.79     0  01:56
  J52           JUNCTION     0.30     0.74    48.79     0  01:56
  J53           JUNCTION     0.29     0.73    48.79     0  01:56
  J54           JUNCTION     0.26     0.69    48.79     0  01:56
  J55           JUNCTION     0.29     0.73    48.79     0  01:56
  Out1          OUTFALL      0.09     0.12    48.07     0  00:34
  *******************
  Node Inflow Summary
  *******************
  -------------------------------------------------------------------------------------
```

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	0.00	28.65	0 05:35	0.000	0.423
J26	JUNCTION	0.00	27.67	0 01:07	0.000	0.423
J27	JUNCTION	8.17	24.87	0 01:01	0.030	0.304
J28	JUNCTION	8.17	22.62	0 01:01	0.030	0.274
J35	JUNCTION	0.00	13.32	0 01:06	0.000	0.119
J39	JUNCTION	8.17	19.03	0 01:06	0.030	0.119
J41	JUNCTION	8.17	16.35	0 01:06	0.030	0.089
J49	JUNCTION	8.17	20.24	0 00:49	0.030	0.245
J50	JUNCTION	58.52	58.52	0 01:08	0.207	0.306
J51	JUNCTION	0.00	13.25	0 01:07	0.000	0.042
J52	JUNCTION	8.17	13.56	0 01:06	0.030	0.059
J53	JUNCTION	2.68	17.86	0 01:08	0.009	0.082
J54	JUNCTION	0.00	7.59	0 01:12	0.000	0.024
J55	JUNCTION	8.17	8.17	0 01:08	0.030	0.030
Out1	OUTFALL	0.00	20.00	0 00:34	0.000	0.421

****
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
J51	JUNCTION	0.23	0.007	0.293

****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	83.39	16.21	20.00	0.421
System	83.39	16.21	20.00	0.421

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	20.00	0 00:34	0.97	3.36	0.80
C30	CONDUIT	18.26	0 00:50	0.18	0.12	0.96
C52	CONDUIT	10.60	0 00:36	0.16	0.03	0.97
C54	CONDUIT	13.32	0 01:06	0.20	0.09	0.95
C55	CONDUIT	10.87	0 01:06	0.15	0.07	0.94
C65	CONDUIT	19.96	0 00:50	0.21	0.14	0.98
C66	CONDUIT	28.65	0 05:35	0.45	0.85	0.98
C67	CONDUIT	16.15	0 00:49	0.16	0.11	0.95
C68	CONDUIT	8.19	0 01:06	0.11	0.06	0.93
C69	CONDUIT	14.94	0 02:03	0.15	0.10	0.94
C70	CONDUIT	5.40	0 01:06	0.09	0.04	0.91
C71	CONDUIT	13.25	0 01:07	0.07	0.05	1.00
C72	CONDUIT	7.59	0 01:12	0.07	0.02	0.99
C73	CONDUIT	15.48	0 01:05	0.19	0.07	0.92

****
Flow Classification Summary
****

Adjusted /Actual	--- Fraction of Time in Flow Class ---- Up	Down	Sub	Sup	Up	Down	Avg. Froude	Avg. Flow

Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Number	Change
C2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.56	0.0001
C30	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000
C52	1.00	0.00	0.17	0.00	0.83	0.00	0.00	0.00	0.02	0.0000
C54	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
C55	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
C65	1.00	0.00	0.06	0.00	0.94	0.00	0.00	0.00	0.05	0.0000
C66	1.00	0.00	0.00	0.00	0.63	0.00	0.00	0.37	0.11	0.0015
C67	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000
C68	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
C69	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000
C70	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C71	1.00	0.00	0.10	0.00	0.89	0.00	0.00	0.00	0.01	0.0000
C72	1.00	0.14	0.00	0.00	0.86	0.00	0.00	0.00	0.01	0.0000
C73	1.00	0.00	0.15	0.00	0.85	0.00	0.00	0.00	0.02	0.0000

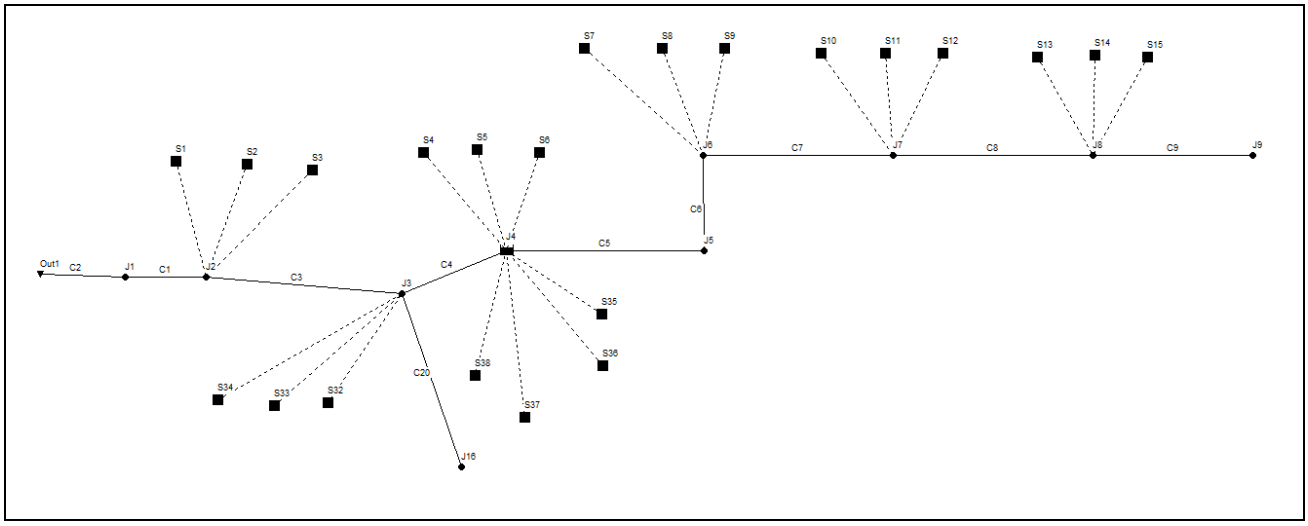
****

Conduit Surcharge Summary

****

Conduit	Hours Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C2	0.01	0.01	0.01	5.88	0.01
C71	0.23	0.23	0.23	0.01	0.01

FOSSETTA SAN GIULIO



- Durata 24h – T_R50anni

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ OCT-31-2012 00:00:00
Ending Date .............. NOV-04-2012 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:00:30
Dry Time Step ............ 00:01:00
Routing Time Step ........ 30.00 sec
**************************          Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.515       115.530
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.084        18.928
Surface Runoff ...........         0.426        95.523
Final Surface Storage ....         0.005         1.079
Continuity Error (%) .....         0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.426         4.261
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

External Inflow 0.000 0.000
External Outflow 0.423 4.228
Internal Outflow 0.000 0.000
Storage Losses 0.000 0.000
Initial Stored Volume 0.000 0.000
Final Stored Volume 0.003 0.033
Continuity Error (%) 0.003
****

Time-Step Critical Elements
****

Link C2 (74.67%)
Link C1 (25.09%)
****

Highest Flow Instability Indexes
****

All links are stable.
****

Routing Time Step Summary
****

Minimum Time Step : 0.78 sec
Average Time Step : 2.57 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S12	115.53	0.00	0.00	6.15	108.38	0.68	15.70	0.938
S11	115.53	0.00	0.00	42.26	72.00	0.05	1.41	0.623
S10	115.53	0.00	0.00	57.53	56.73	0.06	1.55	0.491
S15	115.53	0.00	0.00	6.15	108.38	0.92	21.24	0.938
S14	115.53	0.00	0.00	42.26	72.00	0.13	3.48	0.623
S13	115.53	0.00	0.00	57.53	56.73	0.06	1.55	0.491
S9	115.53	0.00	0.00	6.15	108.38	0.32	7.34	0.938
S8	115.53	0.00	0.00	42.25	72.01	0.02	0.49	0.623
S7	115.53	0.00	0.00	57.51	56.75	0.03	0.81	0.491
S6	115.53	0.00	0.00	6.15	108.38	0.76	17.49	0.938
S5	115.53	0.00	0.00	42.26	72.00	0.06	1.71	0.623
S4	115.53	0.00	0.00	57.53	56.73	0.07	1.87	0.491
S3	115.53	0.00	0.00	6.15	108.38	0.64	14.64	0.938
S2	115.53	0.00	0.00	42.26	72.00	0.06	1.58	0.623
S1	115.53	0.00	0.00	57.53	56.73	0.04	1.16	0.491
S32	115.53	0.00	0.00	6.15	108.38	0.10	2.25	0.938
S33	115.53	0.00	0.00	42.26	72.00	0.02	0.64	0.623
S34	115.53	0.00	0.00	57.53	56.73	0.03	0.70	0.491
S35	115.53	0.00	0.00	42.26	72.00	0.04	1.07	0.623
S36	115.53	0.00	0.00	57.65	56.61	0.03	0.89	0.490
S37	115.53	0.00	0.00	42.26	72.00	0.08	2.31	0.623
S38	115.53	0.00	0.00	57.53	56.73	0.06	1.59	0.491

****

Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.62	1.00	45.70	0 23:17
J2	JUNCTION	0.57	0.95	45.70	0 23:17
J6	JUNCTION	0.02	0.13	45.96	0 13:36
J7	JUNCTION	0.04	0.22	46.51	0 13:36
J8	JUNCTION	0.02	0.13	47.52	0 13:36
J9	JUNCTION	0.00	0.00	48.65	0 00:00
J5	JUNCTION	0.05	0.20	45.70	0 23:14
J3	JUNCTION	0.57	0.95	45.70	0 23:17
J16	JUNCTION	0.57	0.95	45.70	0 23:17
Out1	OUTFALL	0.10	0.11	44.81	0 06:33
J4	STORAGE	0.35	0.70	45.70	0 23:15

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	0.00	16.29	0 09:04	0.000	4.228
J2	JUNCTION	17.39	35.75	0 13:29	0.738	4.283
J6	JUNCTION	8.64	53.43	0 13:35	0.367	2.268
J7	JUNCTION	18.65	44.87	0 13:35	0.792	1.901
J8	JUNCTION	26.27	26.27	0 13:35	1.109	1.109
J9	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J5	JUNCTION	0.00	53.41	0 13:36	0.000	2.268
J3	JUNCTION	3.59	52.74	0 13:44	0.147	3.967
J16	JUNCTION	0.00	14.21	0 10:32	0.000	0.229
Out1	OUTFALL	0.00	16.00	0 06:33	0.000	4.228
J4	STORAGE	26.91	98.36	0 13:18	1.108	3.570

****
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
J1	JUNCTION	41.55	0.346	0.154

****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt	E&I Pcnt Full	Loss	Maximum Volume 1000 m3	Max Pcnt	Time of Max Occurrence days hr:min	Maximum Outflow LPS
J4	1.004	41	0		2.102	85	0 23:15	49.36

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	99.80	14.53	16.00	4.228
System	99.80	14.53	16.00	4.228

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	16.29	0 09:04	0.44	0.57	1.00
C2	CONDUIT	16.00	0 06:33	0.75	7.90	0.77
C7	CONDUIT	44.79	0 13:36	0.34	0.06	0.25
C8	CONDUIT	26.22	0 13:36	0.20	0.03	0.25
C9	CONDUIT	0.00	0 00:00	0.00	0.00	0.09
C6	CONDUIT	53.41	0 13:36	0.89	0.03	0.13
C5	CONDUIT	53.33	0 13:36	0.18	0.04	0.56
C4	CONDUIT	49.36	0 13:44	0.33	0.03	0.82
C3	CONDUIT	26.18	2 19:52	0.06	0.32	0.95
C20	CONDUIT	14.21	0 10:32	0.03	0.14	0.95

****

Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C1	1.00	0.00	0.00	0.00	0.90	0.00	0.00	0.10	0.08	0.0001
C2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.51	0.0001
C7	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.15	0.0000
C8	1.00	0.00	0.04	0.00	0.96	0.00	0.00	0.00	0.07	0.0000
C9	1.00	0.04	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C6	1.00	0.00	0.02	0.00	0.97	0.00	0.00	0.00	0.22	0.0000
C5	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	0.06	0.0001
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0005
C20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0003

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	41.55	41.55	41.55	0.01	0.01
C2	0.01	0.01	0.01	76.50	0.01

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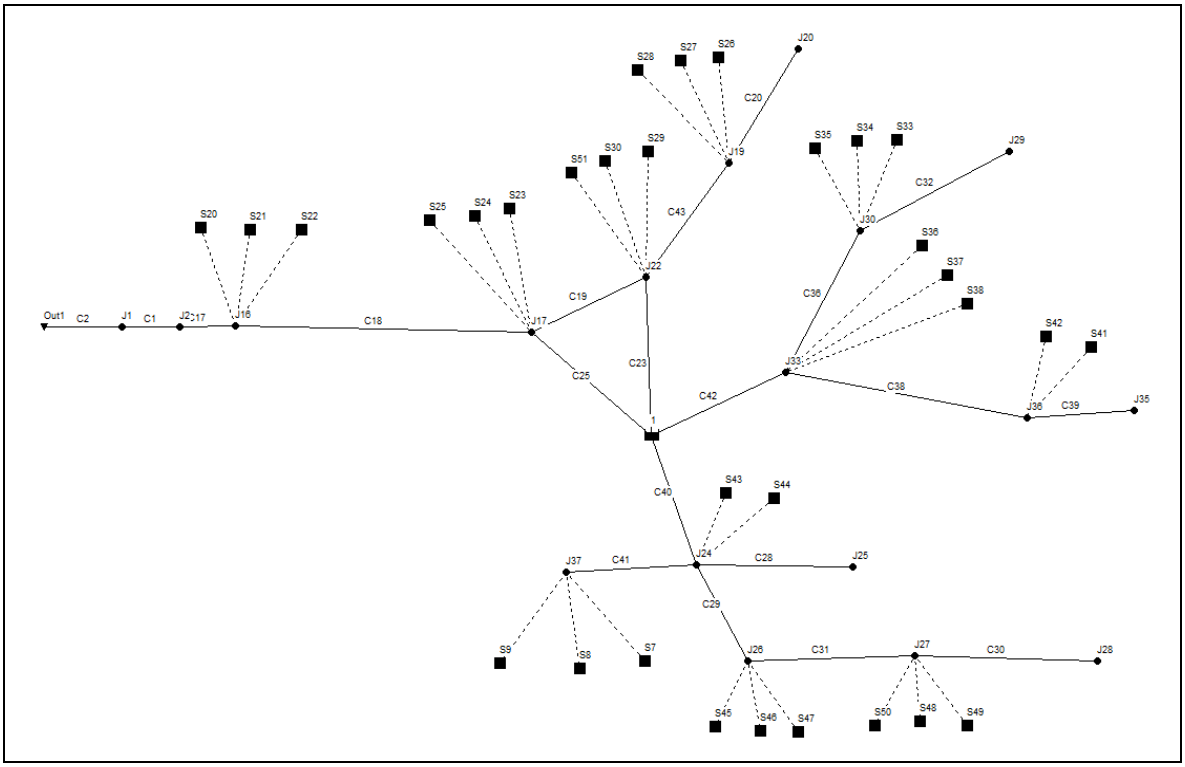

- Durata 24h – T_R50anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date OCT-31-2012 00:00:00
Ending Date NOV-04-2012 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:00:10
Wet Time Step 00:00:05
Dry Time Step 00:00:10
Routing Time Step ..... 1.00 sec
****
Element Count
****
Number of rain gages 1
Number of subcatchments ... 31
Number of nodes 20
Number of links 20
Number of pollutants 0

Number of land uses 0
****

Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
Gage1	RE_EST_TR50_24H	VOLUME	48 min.

****

Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
S7	0.42	163.00	80.00	7.0000	Gage1	J37
S8	0.08	140.00	0.00	67.0000	Gage1	J37
S9	0.14	140.00	0.00	0.0100	Gage1	J37
S20	0.44	179.00	100.00	7.0000	Gage1	J16
S21	0.06	179.00	0.00	67.0000	Gage1	J16
S22	0.09	179.00	0.00	0.0100	Gage1	J16
S23	0.04	46.00	80.00	7.0000	Gage1	J17
S24	0.02	46.00	0.00	7.0000	Gage1	J17
S25	0.02	46.00	0.00	0.0100	Gage1	J17
S26	0.15	134.00	80.00	7.0000	Gage1	J19
S27	0.01	35.00	0.00	67.0000	Gage1	J19
S28	0.07	134.00	0.00	0.0100	Gage1	J19
S29	0.13	230.00	0.00	67.0000	Gage1	J22
S30	0.28	230.00	0.00	0.0100	Gage1	J22
S33	0.15	100.00	80.00	7.0000	Gage1	J30
S34	0.02	80.00	0.00	67.0000	Gage1	J30
S35	0.13	136.00	0.00	0.0100	Gage1	J30
S36	0.10	125.00	80.00	7.0000	Gage1	J33
S37	0.12	125.00	0.00	67.0000	Gage1	J33
S38	0.28	125.00	0.00	0.0100	Gage1	J33
S41	0.06	100.00	0.00	67.0000	Gage1	J36
S42	0.04	42.00	0.00	0.0100	Gage1	J36
S43	0.07	128.00	0.00	67.0000	Gage1	J24
S44	0.13	128.00	0.00	0.0100	Gage1	J24
S45	0.38	154.00	80.00	7.0000	Gage1	J26
S46	0.10	155.00	0.00	67.0000	Gage1	J26
S47	0.08	154.00	0.00	0.0100	Gage1	J26
S48	0.11	155.00	0.00	67.0000	Gage1	J27
S49	0.08	155.00	0.00	0.0100	Gage1	J27
S50	0.62	155.00	80.00	7.0000	Gage1	J27
S51	0.09	98.00	80.00	7.0000	Gage1	J22

****

Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	43.25	1.00	100.0	
J2	JUNCTION	43.30	0.95	100.0	
J16	JUNCTION	43.40	0.70	0.0	
J17	JUNCTION	43.44	1.00	0.0	
J19	JUNCTION	43.58	0.70	0.0	
J20	JUNCTION	44.60	0.70	0.0	
J22	JUNCTION	43.53	1.00	0.0	
J24	JUNCTION	43.57	1.00	0.0	
J25	JUNCTION	44.34	0.70	0.0	
J26	JUNCTION	43.67	1.00	0.0	
J27	JUNCTION	44.51	0.70	0.0	
J28	JUNCTION	45.36	0.70	0.0	
J29	JUNCTION	44.36	0.70	0.0	
J30	JUNCTION	43.95	0.70	0.0	
J33	JUNCTION	43.55	1.00	0.0	
J35	JUNCTION	45.30	0.70	0.0	
J36	JUNCTION	43.89	0.70	0.0	
J37	JUNCTION	43.60	0.70	0.0	
Out1	OUTFALL	43.00	0.32	0.0	
1	STORAGE	43.48	0.70	0.0	

****

Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J2	J1	CONDUIT	1.0	0.0305	0.0150
C2	J1	Out1	CONDUIT	10.0	2.5008	0.0150
C17	J16	J2	CONDUIT	5.0	2.0004	0.0200
C18	J17	J16	CONDUIT	179.0	0.0223	0.0500
C19	J22	J17	CONDUIT	46.0	0.1957	0.0500
C20	J20	J19	CONDUIT	134.0	0.7612	0.0500
C23	J22	1	CONDUIT	28.0	0.1786	0.0200
C25	1	J17	CONDUIT	26.0	0.1538	0.0200
C28	J25	J24	CONDUIT	94.0	0.8192	0.0500
C29	J26	J24	CONDUIT	38.0	0.2632	0.0200
C30	J28	J27	CONDUIT	155.0	0.5484	0.0100
C31	J27	J26	CONDUIT	154.0	0.5455	0.0500
C32	J29	J30	CONDUIT	50.0	0.8200	0.0500
C36	J30	J33	CONDUIT	50.0	0.8000	0.0500
C38	J36	J33	CONDUIT	125.0	0.2720	0.0500
C39	J35	J36	CONDUIT	42.0	3.3590	0.0500
C40	J24	1	CONDUIT	8.0	1.1251	0.0200
C41	J37	J24	CONDUIT	104.0	0.0288	0.0500
C42	J33	1	CONDUIT	28.0	0.2500	0.0200
C43	J19	J22	CONDUIT	98.0	0.0510	0.0500

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Hyd. Area	Max. Rad.	No. of Width	Full Barrels	Flow
C1	CIRCULAR	0.20	0.03	0.05	0.20	1	4.96
C2	CIRCULAR	0.32	0.08	0.08	0.32	1	150.96
C17	CIRCULAR	0.60	0.28	0.15	0.60	1	564.51
C18	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	163.81
C19	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	484.70
C20	TRAPEZOIDAL	0.70	1.13	0.36	2.74	1	1003.24
C23	CIRCULAR	1.00	0.79	0.25	1.00	1	658.60
C25	CIRCULAR	1.00	0.79	0.25	1.00	1	611.30
C28	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	991.78
C29	CIRCULAR	1.00	0.79	0.25	1.00	1	799.51
C30	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	4057.38
C31	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	809.30
C32	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	992.30
C36	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	980.12
C38	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	571.50
C39	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	2008.33
C40	CIRCULAR	1.00	0.79	0.25	1.00	1	1653.11
C41	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	186.11
C42	CIRCULAR	1.00	0.79	0.25	1.00	1	779.26
C43	TRAPEZOIDAL	0.70	1.08	0.36	2.60	1	247.51

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.540	120.262
Evaporation Loss	0.000	0.000
Infiltration Loss	0.127	28.257
Surface Runoff	0.408	90.896
Final Surface Storage	0.005	1.109
Continuity Error (%)	0.000	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.408	4.080
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.382	3.823
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.027	0.275
Continuity Error (%)	-0.426	

****
Time-Step Critical Elements

****
Link C1 (38.15%)
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 0.84 sec
Maximum Time Step : 1.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.43
****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S7	120.26	0.00	0.00	8.31	110.93	0.47	10.86	0.922
S8	120.26	0.00	0.00	42.84	76.15	0.06	1.56	0.633
S9	120.26	0.00	0.00	58.75	60.24	0.08	2.28	0.501
S20	120.26	0.00	0.00	0.00	119.31	0.52	11.81	0.992
S21	120.26	0.00	0.00	42.84	76.16	0.05	1.29	0.633
S22	120.26	0.00	0.00	58.62	60.37	0.05	1.47	0.502
S23	120.26	0.00	0.00	8.31	110.93	0.04	1.04	0.922
S24	120.26	0.00	0.00	42.84	76.15	0.01	0.33	0.633
S25	120.26	0.00	0.00	58.62	60.37	0.01	0.38	0.502
S26	120.26	0.00	0.00	8.31	110.93	0.16	3.80	0.922
S27	120.26	0.00	0.00	41.56	78.65	0.00	0.11	0.654
S28	120.26	0.00	0.00	57.14	63.07	0.04	1.10	0.524
S29	120.26	0.00	0.00	42.84	76.15	0.10	2.60	0.633
S30	120.26	0.00	0.00	58.80	60.20	0.17	4.51	0.501
S33	120.26	0.00	0.00	8.31	110.93	0.17	3.96	0.922
S34	120.26	0.00	0.00	42.83	76.16	0.02	0.46	0.633
S35	120.26	0.00	0.00	57.46	61.53	0.08	2.07	0.512
S36	120.26	0.00	0.00	8.31	110.93	0.11	2.56	0.922
S37	120.26	0.00	0.00	42.84	76.15	0.09	2.38	0.633
S38	120.26	0.00	0.00	58.99	60.00	0.17	4.47	0.499
S41	120.26	0.00	0.00	42.84	76.15	0.05	1.32	0.633
S42	120.26	0.00	0.00	58.75	60.24	0.03	0.68	0.501
S43	120.26	0.00	0.00	42.84	76.15	0.05	1.42	0.633
S44	120.26	0.00	0.00	58.74	60.25	0.08	2.03	0.501
S45	120.26	0.00	0.00	8.31	110.93	0.42	9.74	0.922
S46	120.26	0.00	0.00	42.84	76.15	0.08	2.16	0.633
S47	120.26	0.00	0.00	58.62	60.37	0.05	1.26	0.502
S48	120.26	0.00	0.00	42.84	76.15	0.08	2.17	0.633
S49	120.26	0.00	0.00	58.62	60.37	0.05	1.27	0.502
S50	120.26	0.00	0.00	8.31	110.93	0.69	15.98	0.922
S51	120.26	0.00	0.00	8.31	110.93	0.10	2.23	0.922

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.39	0.84	44.09	0 23:25
J2	JUNCTION	0.37	0.79	44.09	0 23:25
J16	JUNCTION	0.30	0.69	44.09	0 23:25
J17	JUNCTION	0.30	0.65	44.09	0 23:28
J19	JUNCTION	0.18	0.51	44.09	0 23:29
J20	JUNCTION	0.00	0.00	44.60	0 00:00
J22	JUNCTION	0.22	0.56	44.09	0 23:27
J24	JUNCTION	0.19	0.52	44.09	0 23:30
J25	JUNCTION	0.00	0.00	44.34	0 00:00
J26	JUNCTION	0.14	0.42	44.09	0 23:30
J27	JUNCTION	0.02	0.11	44.62	0 13:36
J28	JUNCTION	0.00	0.00	45.36	0 00:00

J29	JUNCTION	0.00	0.00	44.36	0	00:00
J30	JUNCTION	0.02	0.14	44.09	0	23:31
J33	JUNCTION	0.21	0.54	44.09	0	23:31
J35	JUNCTION	0.00	0.00	45.30	0	00:00
J36	JUNCTION	0.03	0.20	44.09	0	23:25
J37	JUNCTION	0.18	0.49	44.09	0	23:30
Out1	OUTFALL	0.05	0.06	43.06	0	08:31
1	STORAGE	0.27	0.61	44.09	0	23:28

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	0.00	39.93	3 04:29	0.000	3.822
J2	JUNCTION	0.00	83.87	0 11:26	0.000	4.596
J16	JUNCTION	14.57	71.75	0 11:15	0.625	4.587
J17	JUNCTION	1.75	12.64	2 15:46	0.071	3.198
J19	JUNCTION	5.01	5.01	0 13:35	0.211	0.211
J20	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J22	JUNCTION	9.35	12.51	0 13:34	0.361	1.123
J24	JUNCTION	3.46	95.88	0 13:32	0.128	2.136
J25	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J26	JUNCTION	13.16	32.56	0 13:35	0.548	1.368
J27	JUNCTION	19.43	19.43	0 13:35	0.818	0.818
J28	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J29	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J30	JUNCTION	6.49	6.49	0 13:35	0.266	0.266
J33	JUNCTION	9.37	17.83	0 13:36	0.366	0.708
J35	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J36	JUNCTION	2.00	2.00	0 13:35	0.074	0.074
J37	JUNCTION	14.69	14.69	0 13:35	0.612	0.612
Out1	OUTFALL	0.00	13.50	0 08:31	0.000	3.823
1	STORAGE	0.00	150.79	0 13:28	0.000	3.090

****
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
J1	JUNCTION	65.64	0.520	0.165
J2	JUNCTION	31.57	0.187	0.163

****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	1.117	37	0	2.577	86	0 23:28	39.08

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	98.73	10.48	13.50	3.823
System	98.73	10.48	13.50	3.823

****

Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	39.93	3	04:29	1.27	8.05	1.00
C2	CONDUIT	13.50	0	08:31	1.20	0.09	0.60
C17	CONDUIT	83.87	0	11:26	0.70	0.15	1.00
C18	CONDUIT	13.12	2	15:49	0.12	0.08	0.95
C19	CONDUIT	4.64	0	13:42	0.06	0.01	0.86
C20	CONDUIT	0.00	0	00:00	0.00	0.00	0.36
C23	CONDUIT	8.38	0	13:35	0.15	0.01	0.58
C25	CONDUIT	9.67	2	22:35	0.11	0.02	0.63
C28	CONDUIT	0.00	0	00:00	0.00	0.00	0.37
C29	CONDUIT	38.73	0	13:36	0.51	0.05	0.47
C30	CONDUIT	0.00	0	00:00	0.00	0.00	0.08
C31	CONDUIT	19.40	0	13:36	0.23	0.02	0.33
C32	CONDUIT	0.00	0	00:00	0.00	0.00	0.10
C36	CONDUIT	6.48	0	13:36	0.12	0.01	0.48
C38	CONDUIT	1.98	0	13:36	0.04	0.00	0.53
C39	CONDUIT	0.00	0	00:00	0.00	0.00	0.14
C40	CONDUIT	123.52	0	13:30	1.10	0.07	0.56
C41	CONDUIT	18.14	0	13:36	0.13	0.10	0.72
C42	CONDUIT	17.11	0	13:33	0.28	0.02	0.57
C43	CONDUIT	3.43	0	10:37	0.07	0.01	0.76

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C1	1.00	0.01	0.00	0.00	0.61	0.00	0.00	0.38	0.34	0.0301
C2	1.00	0.01	0.00	0.00	0.61	0.38	0.00	0.00	0.79	0.0000
C17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.29	0.0034
C18	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0000
C19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.02	0.0000
C20	1.00	0.01	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C23	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0000
C25	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.04	0.0000
C28	1.00	0.03	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C29	1.00	0.01	0.10	0.00	0.89	0.00	0.00	0.00	0.08	0.0000
C30	1.00	0.24	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C31	1.00	0.11	0.13	0.00	0.76	0.00	0.00	0.00	0.04	0.0000
C32	1.00	0.47	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C36	1.00	0.01	0.46	0.00	0.53	0.00	0.00	0.00	0.02	0.0000
C38	1.00	0.01	0.18	0.00	0.81	0.00	0.00	0.00	0.00	0.0000
C39	1.00	0.19	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C40	1.00	0.01	0.02	0.00	0.88	0.10	0.00	0.00	0.21	0.0000
C41	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.02	0.0000
C42	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.06	0.0000
C43	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.01	0.0000

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C1	67.72	67.72	67.75	80.38	61.26
C17	17.34	17.34	17.34	0.01	0.01

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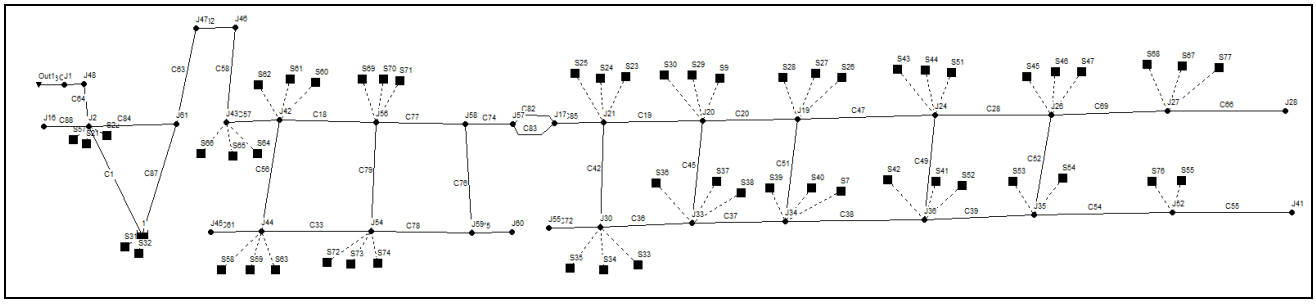

- Durata 12h – T_R50anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date OCT-31-2012 00:00:00
Ending Date NOV-04-2012 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:00:30
Dry Time Step 00:01:00
Routing Time Step ..... 30.00 sec

********** Runoff Quantity Continuity **********	Volume hectare-m ---------	Depth mm -------
Total Precipitation	0.528	100.782
Evaporation Loss	0.000	0.000
Infiltration Loss	0.122	23.228
Surface Runoff	0.401	76.514
Final Surface Storage	0.005	1.041
Continuity Error (%)	0.000	

********** Flow Routing Continuity **********	Volume hectare-m ---------	Volume 10^6 ltr ---------
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.401	4.008
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.395	3.949
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.006	0.058
Continuity Error (%)	0.026	

****
Time-Step Critical Elements
****

Link C86 (81.45%)
Link C60 (14.00%)
****
Highest Flow Instability Indexes
****
Link C51 (6)
Link C45 (3)
****
Routing Time Step Summary
****
Minimum Time Step : 0.73 sec
Average Time Step : 3.38 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S7	100.78	0.00	0.00	7.79	91.97	0.20	9.42	0.913
S9	100.78	0.00	0.00	55.13	44.39	0.02	1.11	0.440
S21	100.78	0.00	0.00	40.24	59.28	0.03	1.56	0.588
S22	100.78	0.00	0.00	52.33	48.40	0.04	1.86	0.480
S23	100.78	0.00	0.00	7.79	92.22	0.20	9.11	0.915
S24	100.78	0.00	0.00	40.23	59.28	0.02	1.05	0.588
S25	100.78	0.00	0.00	52.33	48.40	0.04	2.01	0.480
S26	100.78	0.00	0.00	7.79	91.97	0.20	9.43	0.913
S27	100.78	0.00	0.00	40.24	59.27	0.03	1.78	0.588
S28	100.78	0.00	0.00	52.33	48.40	0.04	2.17	0.480
S29	100.78	0.00	0.00	40.24	59.27	0.02	1.17	0.588
S30	100.78	0.00	0.00	10.47	89.54	0.13	5.81	0.888
S31	100.78	0.00	0.00	40.25	59.26	0.05	2.53	0.588
S32	100.78	0.00	0.00	54.38	45.13	0.13	6.71	0.448
S33	100.78	0.00	0.00	7.79	91.97	0.20	9.11	0.913
S34	100.78	0.00	0.00	40.23	59.28	0.02	1.05	0.588
S35	100.78	0.00	0.00	52.66	46.85	0.04	2.01	0.465
S36	100.78	0.00	0.00	7.79	91.97	0.13	6.01	0.913
S37	100.78	0.00	0.00	40.24	59.27	0.02	1.17	0.588
S38	100.78	0.00	0.00	53.93	45.58	0.02	1.24	0.452
S39	100.78	0.00	0.00	40.24	59.28	0.03	1.78	0.588
S40	100.78	0.00	0.00	53.93	45.58	0.04	2.17	0.452
S41	100.78	0.00	0.00	40.24	59.27	0.03	1.42	0.588
S42	100.78	0.00	0.00	53.93	45.58	0.03	1.55	0.452
S43	100.78	0.00	0.00	40.24	59.28	0.02	1.19	0.588
S44	100.78	0.00	0.00	53.93	45.58	0.03	1.55	0.452
S45	100.78	0.00	0.00	7.79	91.97	0.29	13.29	0.913
S46	100.78	0.00	0.00	40.23	59.28	0.01	0.46	0.588
S47	100.78	0.00	0.00	53.93	45.58	0.02	1.15	0.452
S51	100.78	0.00	0.00	7.79	91.97	0.15	6.82	0.913
S52	100.78	0.00	0.00	7.80	91.97	0.15	6.82	0.913
S53	100.78	0.00	0.00	40.24	59.27	0.03	1.39	0.588
S54	100.78	0.00	0.00	53.94	45.57	0.02	1.18	0.452
S55	100.78	0.00	0.00	8.05	90.96	0.03	1.36	0.903
S57	100.78	0.00	0.00	7.79	91.97	0.47	21.62	0.913
S58	100.78	0.00	0.00	40.24	59.28	0.01	0.81	0.588
S59	100.78	0.00	0.00	53.93	45.58	0.03	1.44	0.452
S60	100.78	0.00	0.00	7.79	91.97	0.21	9.61	0.913
S61	100.78	0.00	0.00	40.23	59.28	0.01	0.65	0.588
S62	100.78	0.00	0.00	53.93	45.58	0.02	1.24	0.452
S63	100.78	0.00	0.00	7.79	91.97	0.05	2.13	0.913
S64	100.78	0.00	0.00	7.79	91.97	0.06	2.98	0.913
S65	100.78	0.00	0.00	40.24	59.28	0.00	0.13	0.588
S66	100.78	0.00	0.00	53.89	45.62	0.00	0.17	0.453
S67	100.78	0.00	0.00	40.24	59.27	0.01	0.35	0.588
S68	100.78	0.00	0.00	7.79	91.97	0.30	13.67	0.913
S69	100.78	0.00	0.00	53.93	45.58	0.03	1.41	0.452
S70	100.78	0.00	0.00	40.23	59.28	0.01	0.74	0.588
S71	100.78	0.00	0.00	7.79	91.97	0.14	6.68	0.913
S72	100.78	0.00	0.00	53.76	45.76	0.03	1.44	0.454

S73	100.78	0.00	0.00	40.23	59.28	0.01	0.74	0.588
S74	100.78	0.00	0.00	7.79	91.97	0.14	6.68	0.913
S76	100.78	0.00	0.00	53.93	45.58	0.02	0.99	0.452
S77	100.78	0.00	0.00	53.93	45.58	0.02	0.95	0.452

****

Node Depth Summary

****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.63	1.02	40.97	0 12:39
J2	JUNCTION	0.45	0.82	40.97	0 12:39
J16	JUNCTION	0.24	0.57	40.97	0 12:39
J17	JUNCTION	0.05	0.30	42.36	0 06:49
J19	JUNCTION	0.26	0.46	42.81	0 06:48
J20	JUNCTION	0.24	0.46	42.63	0 06:49
J21	JUNCTION	0.03	0.26	42.38	0 06:48
J24	JUNCTION	0.01	0.10	42.98	0 06:48
J26	JUNCTION	0.01	0.10	43.18	0 06:48
J27	JUNCTION	0.02	0.13	43.48	0 06:48
J28	JUNCTION	0.00	0.00	43.56	0 00:00
J30	JUNCTION	0.04	0.24	42.41	0 06:48
J33	JUNCTION	0.29	0.51	42.63	0 06:49
J34	JUNCTION	0.31	0.51	42.81	0 06:48
J35	JUNCTION	0.02	0.18	43.06	0 06:49
J36	JUNCTION	0.04	0.30	42.98	0 06:49
J41	JUNCTION	0.00	0.00	43.36	0 00:00
J42	JUNCTION	0.04	0.26	41.60	0 07:02
J43	JUNCTION	0.02	0.14	41.14	0 07:02
J44	JUNCTION	0.06	0.35	41.69	0 07:00
J45	JUNCTION	0.05	0.33	41.69	0 07:00
J46	JUNCTION	0.05	0.22	40.97	0 12:40
J47	JUNCTION	0.09	0.32	40.97	0 12:39
J48	JUNCTION	0.59	0.97	40.97	0 12:39
J52	JUNCTION	0.00	0.04	43.18	0 06:48
J54	JUNCTION	0.05	0.37	41.79	0 06:58
J55	JUNCTION	0.00	0.00	42.20	0 00:00
J56	JUNCTION	0.02	0.17	41.79	0 06:58
J57	JUNCTION	0.04	0.28	42.34	0 06:49
J58	JUNCTION	0.03	0.22	42.02	0 06:50
J59	JUNCTION	0.03	0.25	41.89	0 06:53
J60	JUNCTION	0.03	0.25	41.89	0 06:53
J61	JUNCTION	0.36	0.72	40.97	0 12:39
Out1	OUTFALL	0.09	0.09	39.94	0 03:27
1	STORAGE	0.36	0.72	40.97	0 12:42

****

Node Inflow Summary

****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	0.00	21.60	0 03:29	0.000	3.949
J2	JUNCTION	25.04	150.55	0 06:31	0.532	5.088
J16	JUNCTION	0.00	8.55	0 05:01	0.000	0.101
J17	JUNCTION	0.00	118.20	0 06:48	0.000	2.526
J19	JUNCTION	13.37	31.14	0 06:47	0.278	0.632
J20	JUNCTION	7.90	43.47	0 06:47	0.170	0.873
J21	JUNCTION	12.17	118.54	0 06:47	0.256	2.526
J24	JUNCTION	9.56	17.50	0 06:47	0.197	0.366
J26	JUNCTION	14.89	29.83	0 06:47	0.317	0.636
J27	JUNCTION	14.98	14.98	0 06:47	0.319	0.319
J28	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J30	JUNCTION	12.17	63.64	0 06:47	0.254	1.410
J33	JUNCTION	8.42	56.76	0 06:47	0.174	1.238
J34	JUNCTION	13.37	57.69	0 06:47	0.276	1.267
J35	JUNCTION	2.56	26.73	0 06:47	0.047	0.562
J36	JUNCTION	9.79	44.83	0 06:47	0.202	0.985
J41	JUNCTION	0.00	0.00	0 00:00	0.000	0.000

J42	JUNCTION	11.50	149.25	0 07:01	0.242	3.222
J43	JUNCTION	3.29	152.33	0 07:02	0.070	3.292
J44	JUNCTION	4.38	138.50	0 06:57	0.087	2.986
J45	JUNCTION	0.00	0.53	0 02:50	0.000	0.005
J46	JUNCTION	0.00	152.33	0 07:02	0.000	3.292
J47	JUNCTION	0.00	152.33	0 07:03	0.000	3.292
J48	JUNCTION	0.00	47.59	0 03:49	0.000	3.956
J52	JUNCTION	2.35	2.35	0 06:47	0.047	0.047
J54	JUNCTION	8.86	134.85	0 06:47	0.184	2.893
J55	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J56	JUNCTION	8.83	11.71	0 06:47	0.184	0.218
J57	JUNCTION	0.00	118.15	0 06:48	0.000	2.526
J58	JUNCTION	0.00	118.11	0 06:49	0.000	2.526
J59	JUNCTION	0.00	115.16	0 06:50	0.000	2.494
J60	JUNCTION	0.00	0.50	0 02:47	0.000	0.002
J61	JUNCTION	0.00	152.33	0 07:03	0.000	3.554
Out1	OUTFALL	0.00	20.00	0 03:27	0.000	3.949
1	STORAGE	9.15	125.50	0 06:37	0.173	1.615

****
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
J1	JUNCTION	30.52	0.370	0.080

****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.771	38	0	1.583	78	0 12:42	10.87

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	99.72	18.61	20.00	3.949
System	99.72	18.61	20.00	3.949

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	104.09	0 06:30	0.57	0.15	0.77
C18	CONDUIT	0.00	0 00:00	0.00	0.00	0.26
C19	CONDUIT	43.09	0 06:49	0.22	0.08	0.33
C20	CONDUIT	30.79	0 06:48	0.22	0.17	0.40
C28	CONDUIT	7.94	0 06:48	0.14	0.05	0.20
C33	CONDUIT	134.33	0 06:57	0.24	0.23	0.45
C36	CONDUIT	51.51	0 06:49	0.24	0.12	0.35
C37	CONDUIT	48.35	0 06:48	0.23	0.10	0.35
C38	CONDUIT	44.35	0 06:49	0.19	0.17	0.38
C39	CONDUIT	26.55	0 06:49	0.13	0.06	0.34
C42	CONDUIT	63.35	0 06:48	0.42	0.10	0.25
C45	CONDUIT	4.81	0 06:50	0.03	0.01	0.48
C47	CONDUIT	8.72	0 06:48	0.09	0.05	0.30

C49	CONDUIT	8.61	0 06:08	0.20	0.01	0.20
C51	CONDUIT	9.05	0 06:48	0.04	0.02	0.48
C52	CONDUIT	21.85	0 06:48	0.40	0.02	0.14
C54	CONDUIT	2.32	0 06:48	0.03	0.00	0.15
C55	CONDUIT	0.00	0 00:00	0.00	0.00	0.03
C56	CONDUIT	138.44	0 07:00	0.68	3.05	0.31
C57	CONDUIT	149.25	0 07:02	0.92	0.10	0.29
C58	CONDUIT	152.33	0 07:02	0.81	0.07	0.14
C60	CONDUIT	21.60	0 03:29	0.59	0.82	1.00
C61	CONDUIT	0.53	0 02:50	0.02	0.00	0.42
C62	CONDUIT	152.33	0 07:03	0.94	0.05	0.27
C63	CONDUIT	152.33	0 07:03	0.50	0.05	0.52
C64	CONDUIT	47.59	0 03:49	0.07	0.01	0.81
C66	CONDUIT	0.00	0 00:00	0.00	0.00	0.13
C69	CONDUIT	14.94	0 06:48	0.22	0.07	0.22
C72	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C74	CONDUIT	118.11	0 06:49	0.67	0.12	0.31
C75	CONDUIT	0.50	0 02:47	0.02	0.00	0.32
C76	CONDUIT	115.16	0 06:50	0.81	0.10	0.24
C77	CONDUIT	2.90	0 06:50	0.10	0.02	0.10
C78	CONDUIT	115.02	0 06:53	0.25	0.11	0.39
C79	CONDUIT	11.63	0 06:48	0.29	0.01	0.27
C82	CONDUIT	59.07	0 06:48	0.50	5.66	0.58
C83	CONDUIT	59.07	0 06:48	0.50	5.66	0.58
C84	CONDUIT	125.76	0 06:31	0.11	0.04	0.64
C85	CONDUIT	118.20	0 06:48	0.46	0.08	0.40
C86	CONDUIT	20.00	0 03:27	1.37	0.45	0.74
C87	CONDUIT	27.13	0 08:19	0.33	0.05	0.54
C88	CONDUIT	8.55	0 05:01	0.01	0.00	0.58

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C1	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.08	0.0000
C18	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.0000
C19	1.00	0.00	0.81	0.00	0.19	0.00	0.00	0.03	0.0000
C20	1.00	0.81	0.00	0.00	0.19	0.00	0.00	0.01	0.03	0.0000
C28	1.00	0.05	0.13	0.00	0.82	0.00	0.00	0.00	0.05	0.0000
C33	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
C36	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0000
C37	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.09	0.0000
C38	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000
C39	1.00	0.00	0.01	0.00	0.99	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	0.23	0.0000
C45	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
C47	1.00	0.32	0.00	0.00	0.19	0.00	0.00	0.49	0.04	0.0000
C49	1.00	0.00	0.32	0.00	0.68	0.00	0.00	0.00	0.03	0.0000
C51	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
C52	1.00	0.00	0.18	0.00	0.82	0.00	0.00	0.00	0.08	0.0000
C54	1.00	0.01	0.16	0.00	0.83	0.00	0.00	0.00	0.02	0.0000
C55	1.00	0.17	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C56	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.16	0.0001
C57	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.37	0.0000
C58	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.26	0.0000
C60	1.00	0.00	0.00	0.00	0.91	0.00	0.00	0.08	0.07	0.0000
C61	1.00	0.00	0.51	0.00	0.49	0.00	0.00	0.00	0.00	0.0000
C62	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.28	0.0000
C63	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000
C64	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C66	1.00	0.03	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C69	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.09	0.0000
C72	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C74	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.25	0.0000
C75	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
C76	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.38	0.0000
C77	1.00	0.87	0.00	0.00	0.00	0.00	0.00	0.13	0.02	0.0000
C78	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.09	0.0000
C79	1.00	0.00	0.74	0.00	0.26	0.00	0.00	0.00	0.01	0.0000
C82	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.13	0.0001

C83	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.13	0.0001
C84	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C85	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.09	0.0000
C86	1.00	0.00	0.00	0.00	0.91	0.08	0.00	0.00	0.76	0.0000
C87	1.00	0.24	0.05	0.00	0.69	0.00	0.00	0.02	0.02	0.0000
C88	1.00	0.00	0.08	0.00	0.92	0.00	0.00	0.00	0.00	0.0000

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Conduit Surcharge Summary

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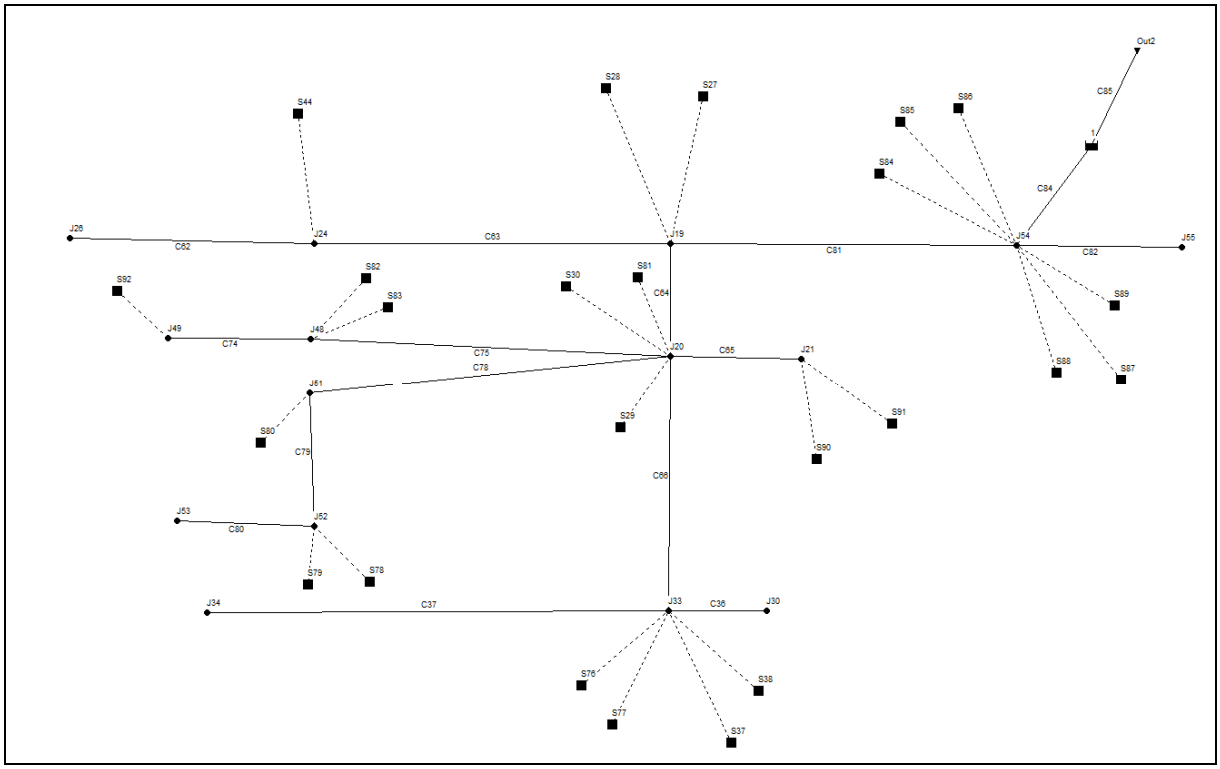
Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C56	0.01	0.01	0.01	7.57	0.01
C60	30.52	30.52	30.52	0.01	0.01
C82	0.01	0.01	0.01	9.30	0.01
C83	0.01	0.01	0.01	9.30	0.01

FOSSETTA VALLE PIEVE MODOLENA OVEST



- Durata 12h – T_R50anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date OCT-31-2012 00:00:00
Ending Date NOV-04-2012 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:00:30
Dry Time Step 00:01:00
Routing Time Step ..... 15.00 sec
********** Volume Depth
Runoff Quantity Continuity hectare-m mm
********** --------- -------
Total Precipitation 0.198 101.078
Evaporation Loss 0.000 0.000
Infiltration Loss 0.042 21.640
Surface Runoff 0.153 78.258
Final Surface Storage 0.002 1.181

```
Continuity Error (%) .....        0.000
**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......        0.000          0.000
Wet Weather Inflow .......        0.153          1.534
Groundwater Inflow .......        0.000          0.000
RDII Inflow ..............        0.000          0.000
External Inflow ..........        0.000          0.000
External Outflow .........        0.153          1.534
Internal Outflow .........        0.000          0.000
Storage Losses ...........        0.000          0.000
Initial Stored Volume ....        0.000          0.000
Final Stored Volume ......        0.000          0.001
Continuity Error (%) .....        0.000
***************************
Time-Step Critical Elements
***************************
Link C85 (86.19%)
Link C84 (1.81%)
********************************
Highest Flow Instability Indexes
********************************
Link C84 (3)
************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     2.58 sec
Maximum Time Step           :    15.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
***************************
Subcatchment Runoff Summary
***************************
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S27	101.08	0.00	0.00	34.20	65.55	0.01	0.58	0.648
S28	101.08	0.00	0.00	48.41	51.43	0.02	0.82	0.509
S29	101.08	0.00	0.00	34.23	65.49	0.10	5.03	0.648
S30	101.08	0.00	0.00	5.86	94.20	0.05	2.25	0.932
S37	101.08	0.00	0.00	34.21	65.51	0.02	0.99	0.648
S38	101.08	0.00	0.00	48.41	51.43	0.01	0.48	0.509
S44	101.08	0.00	0.00	48.44	51.40	0.02	1.02	0.509
S76	101.08	0.00	0.00	48.41	51.43	0.03	1.37	0.509
S77	101.08	0.00	0.00	34.20	65.55	0.02	0.90	0.648
S78	101.08	0.00	0.00	34.26	65.46	0.14	7.40	0.648
S79	101.08	0.00	0.00	5.86	94.20	0.38	17.51	0.932
S80	101.08	0.00	0.00	5.86	94.20	0.20	9.36	0.932
S81	101.08	0.00	0.00	34.21	65.51	0.03	1.63	0.648
S82	101.08	0.00	0.00	5.86	94.20	0.03	1.60	0.932
S83	101.08	0.00	0.00	34.22	65.50	0.04	1.97	0.648
S84	101.08	0.00	0.00	48.41	51.43	0.02	1.10	0.509
S85	101.08	0.00	0.00	5.86	94.20	0.03	1.47	0.932
S86	101.08	0.00	0.00	34.21	65.50	0.03	1.83	0.648
S87	101.08	0.00	0.00	5.86	94.20	0.03	1.34	0.932
S88	101.08	0.00	0.00	34.21	65.50	0.02	1.00	0.648
S89	101.08	0.00	0.00	48.41	51.43	0.01	0.41	0.509
S90	101.08	0.00	0.00	5.86	94.20	0.11	5.07	0.932
S91	101.08	0.00	0.00	34.25	65.46	0.12	6.44	0.648
S92	101.08	0.00	0.00	5.86	94.20	0.07	3.22	0.932

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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
J19	JUNCTION	0.13	0.38	40.67	0 07:12

J20	JUNCTION	0.13	0.38	40.67	0	07:12
J21	JUNCTION	0.09	0.32	40.67	0	07:12
J24	JUNCTION	0.10	0.35	40.67	0	07:13
J26	JUNCTION	0.08	0.31	40.67	0	07:14
J30	JUNCTION	0.09	0.32	40.67	0	07:13
J33	JUNCTION	0.13	0.38	40.67	0	07:13
J34	JUNCTION	0.08	0.30	40.67	0	07:14
J48	JUNCTION	0.10	0.35	40.67	0	07:12
J49	JUNCTION	0.09	0.32	40.67	0	07:12
J51	JUNCTION	0.11	0.36	40.68	0	07:12
J52	JUNCTION	0.10	0.34	40.68	0	07:12
J53	JUNCTION	0.09	0.32	40.68	0	07:12
J54	JUNCTION	0.08	0.25	40.50	0	11:41
J55	JUNCTION	0.05	0.20	40.50	0	11:43
Out2	OUTFALL	0.08	0.10	39.75	0	03:52
1	STORAGE	0.53	0.84	40.49	0	11:37

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J19	JUNCTION	1.40	63.60	0 07:41	0.026	1.436
J20	JUNCTION	8.92	61.70	0 06:48	0.176	1.394
J21	JUNCTION	11.51	11.51	0 06:48	0.233	0.235
J24	JUNCTION	1.02	3.49	0 12:20	0.019	0.064
J26	JUNCTION	0.00	1.72	0 12:31	0.000	0.014
J30	JUNCTION	0.00	0.77	0 12:21	0.000	0.007
J33	JUNCTION	3.73	4.31	0 08:05	0.070	0.128
J34	JUNCTION	0.00	1.21	0 04:05	0.000	0.017
J48	JUNCTION	3.57	6.61	0 06:48	0.072	0.148
J49	JUNCTION	3.22	3.22	0 06:48	0.070	0.072
J51	JUNCTION	9.36	33.75	0 06:48	0.203	0.729
J52	JUNCTION	24.91	24.91	0 06:48	0.521	0.529
J53	JUNCTION	0.00	0.77	0 12:31	0.000	0.006
J54	JUNCTION	7.15	348.65	0 11:36	0.143	3.839
J55	JUNCTION	0.00	25.64	0 11:38	0.000	0.127
Out2	OUTFALL	0.00	16.00	0 03:52	0.000	1.534
1	STORAGE	0.00	788.83	0 11:41	0.000	3.703

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.414	37	0	0.928	83	0 11:37	312.35

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out2	89.70	15.01	16.00	1.534
System	89.70	15.01	16.00	1.534

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C36	CONDUIT	0.92	0 12:07	0.02	0.00	0.50
C37	CONDUIT	1.27	0 12:26	0.02	0.00	0.49
C62	CONDUIT	1.94	0 12:29	0.03	0.01	0.47
C63	CONDUIT	3.79	0 12:18	0.05	0.02	0.52
C64	CONDUIT	60.68	0 06:48	0.23	0.86	0.38
C65	CONDUIT	11.40	0 06:48	0.05	0.02	0.50
C66	CONDUIT	6.10	0 08:28	0.12	0.19	0.38
C74	CONDUIT	3.04	0 06:48	0.05	0.01	0.48
C75	CONDUIT	6.50	0 07:40	0.03	0.03	0.52
C78	CONDUIT	33.20	0 06:48	0.10	0.14	0.53
C79	CONDUIT	24.38	0 06:48	0.07	0.12	0.50
C80	CONDUIT	0.81	0 12:54	0.02	0.00	0.48
C81	CONDUIT	66.98	0 08:00	0.35	0.28	0.36
C82	CONDUIT	29.93	0 11:36	0.26	0.07	0.32
C84	CONDUIT	788.83	0 11:41	1.90	0.09	0.54
C85	CONDUIT	16.00	0 03:52	0.72	2.06	0.66

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C36	1.00	0.00	0.13	0.00	0.87	0.00	0.00	0.00	0.00	0.0000
C37	1.00	0.00	0.07	0.00	0.93	0.00	0.00	0.00	0.00	0.0000
C62	1.00	0.01	0.07	0.00	0.92	0.00	0.00	0.00	0.01	0.0000
C63	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.01	0.0000
C64	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0002
C65	1.00	0.00	0.17	0.00	0.83	0.00	0.00	0.00	0.01	0.0000
C66	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0001
C74	1.00	0.04	0.06	0.00	0.90	0.00	0.00	0.00	0.00	0.0000
C75	1.00	0.00	0.04	0.00	0.96	0.00	0.00	0.00	0.01	0.0000
C78	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
C79	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.02	0.0000
C80	1.00	0.01	0.11	0.00	0.89	0.00	0.00	0.00	0.00	0.0000
C81	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0003
C82	1.00	0.02	0.18	0.00	0.80	0.00	0.00	0.00	0.02	0.0004
C84	1.00	0.00	0.02	0.00	0.96	0.02	0.00	0.00	0.17	0.0007
C85	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.30	0.0000

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C85	0.01	0.01	0.01	26.40	0.01

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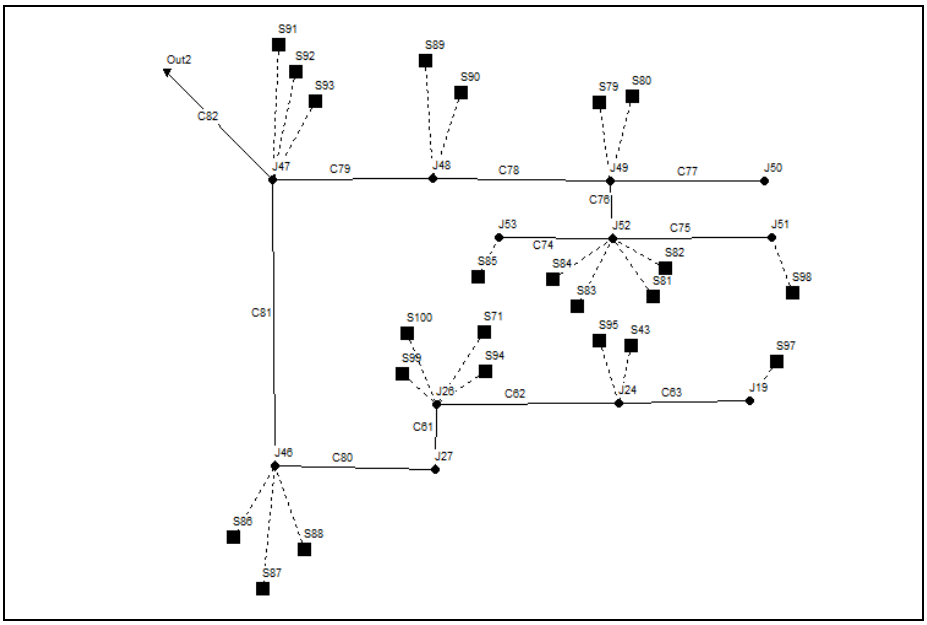

- Durata 12h – T_R50anni

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ OCT-31-2012 00:00:00
Ending Date .............. NOV-04-2012 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:00:30
Dry Time Step ............ 00:01:00
Routing Time Step ........ 30.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.245       101.078
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.054        22.134
Surface Runoff ...........        0.189        77.772
Final Surface Storage ....        0.003         1.173
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity       hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.189         1.887
```

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Groundwater Inflow .......        0.000        0.000
RDII Inflow ..............      0.000        0.000
External Inflow ..........      0.000        0.000
External Outflow .........      0.188        1.884
Internal Outflow .........      0.000        0.000
Storage Losses ...........      0.000        0.000
Initial Stored Volume ....      0.000        0.000
Final Stored Volume ......      0.000        0.002
Continuity Error (%) .....      0.000
**************************
Time-Step Critical Elements
**************************
Link C82 (78.65%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     3.96 sec
Average Time Step          :    10.33 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S43	101.08	0.00	0.00	36.27	63.48	0.08	4.47	0.628
S71	101.08	0.00	0.00	36.24	63.51	0.11	5.65	0.628
S79	101.08	0.00	0.00	40.30	59.51	0.03	1.62	0.589
S80	101.08	0.00	0.00	36.22	63.57	0.02	1.02	0.629
S81	101.08	0.00	0.00	7.81	92.23	0.08	3.50	0.913
S82	101.08	0.00	0.00	36.24	63.51	0.13	6.77	0.628
S83	101.08	0.00	0.00	7.81	92.23	0.07	3.03	0.913
S84	101.08	0.00	0.00	36.27	63.47	0.10	5.18	0.628
S85	101.08	0.00	0.00	36.26	63.48	0.02	0.85	0.628
S86	101.08	0.00	0.00	36.30	63.54	0.03	1.52	0.629
S87	101.08	0.00	0.00	7.80	92.26	0.07	3.42	0.913
S88	101.08	0.00	0.00	36.26	63.50	0.03	1.83	0.628
S89	101.08	0.00	0.00	53.73	46.08	0.02	1.10	0.456
S90	101.08	0.00	0.00	36.23	63.51	0.06	2.98	0.628
S91	101.08	0.00	0.00	36.23	63.51	0.06	3.22	0.628
S92	101.08	0.00	0.00	7.81	92.23	0.07	3.08	0.913
S93	101.08	0.00	0.00	40.30	59.51	0.03	1.46	0.589
S94	101.08	0.00	0.00	7.81	92.24	0.28	13.03	0.913
S95	101.08	0.00	0.00	7.81	92.24	0.21	9.53	0.913
S97	101.08	0.00	0.00	7.81	92.24	0.09	4.27	0.913
S98	101.08	0.00	0.00	7.81	92.24	0.06	2.95	0.913
S99	101.08	0.00	0.00	7.81	92.24	0.22	10.34	0.913
S100	101.08	0.00	0.00	36.22	63.53	0.03	1.86	0.629

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J19	JUNCTION	0.22	0.58	40.95	0 11:12
J24	JUNCTION	0.25	0.62	40.95	0 11:12
J26	JUNCTION	0.29	0.68	40.95	0 11:12
J27	JUNCTION	0.29	0.68	40.95	0 11:12
J46	JUNCTION	0.29	0.68	40.95	0 11:12
J47	JUNCTION	0.36	0.78	40.95	0 11:15
J48	JUNCTION	0.36	0.78	40.95	0 11:14
J49	JUNCTION	0.31	0.72	40.95	0 11:16
J50	JUNCTION	0.26	0.64	40.95	0 11:17

J51	JUNCTION	0.28	0.67	40.95	0	11:15
J52	JUNCTION	0.31	0.72	40.95	0	11:15
J53	JUNCTION	0.28	0.67	40.95	0	11:15
Out2	OUTFALL	0.08	0.11	40.28	0	03:57

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J19	JUNCTION	4.27	4.27	0 06:47	0.092	0.092
J24	JUNCTION	14.00	14.75	0 06:47	0.290	0.382
J26	JUNCTION	30.88	37.87	0 06:46	0.646	1.027
J27	JUNCTION	0.00	33.53	0 06:11	0.000	1.027
J46	JUNCTION	6.77	36.02	0 06:12	0.137	1.164
J47	JUNCTION	7.75	38.54	0 06:12	0.154	2.071
J48	JUNCTION	4.08	16.13	0 06:13	0.076	0.828
J49	JUNCTION	2.64	15.77	0 06:47	0.049	0.652
J50	JUNCTION	0.00	5.21	0 06:48	0.000	0.086
J51	JUNCTION	2.95	4.54	0 06:46	0.064	0.084
J52	JUNCTION	18.49	18.49	0 06:47	0.365	0.495
J53	JUNCTION	0.85	2.71	0 06:47	0.016	0.046
Out2	OUTFALL	0.00	20.00	0 03:57	0.000	1.884

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out2	85.68	15.85	20.00	1.884
System	85.68	15.85	20.00	1.884

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C61	CONDUIT	33.53	0 06:11	0.24	0.52	0.68
C62	CONDUIT	9.30	0 04:48	0.03	0.01	0.82
C63	CONDUIT	2.14	0 04:48	0.02	0.00	0.76
C74	CONDUIT	1.91	0 06:49	0.01	0.00	0.87
C75	CONDUIT	1.76	0 06:51	0.01	0.00	0.87
C76	CONDUIT	7.52	0 07:21	0.21	0.13	0.72
C77	CONDUIT	5.21	0 06:48	0.02	0.01	0.86
C78	CONDUIT	9.56	0 12:32	0.03	0.01	0.94
C79	CONDUIT	12.44	0 12:33	0.06	0.24	0.98
C80	CONDUIT	29.51	0 06:10	0.12	0.93	0.98
C81	CONDUIT	31.15	0 06:09	0.31	0.05	0.73
C82	CONDUIT	20.00	0 03:57	0.62	5.76	0.68

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Froude Number	Avg. Flow Change

C61	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0001
C62	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
C63	1.00	0.00	0.12	0.00	0.88	0.00	0.00	0.00	0.00	0.0000
C74	1.00	0.00	0.18	0.00	0.82	0.00	0.00	0.00	0.00	0.0000
C75	1.00	0.00	0.10	0.00	0.89	0.00	0.00	0.00	0.00	0.0000
C76	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0001
C77	1.00	0.00	0.13	0.00	0.86	0.00	0.00	0.00	0.00	0.0000
C78	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C79	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0001
C80	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0002
C81	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000
C82	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.31	0.0003

****

Conduit Surcharge Summary

****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C82	0.01	0.01	0.01	27.60	0.01

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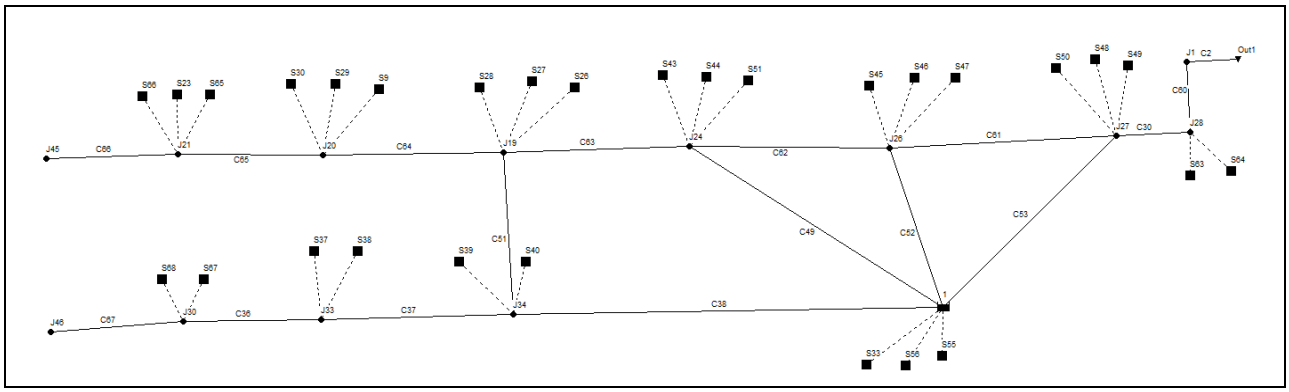

- Durata 6h – T_R50anni

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ OCT-31-2012 00:00:00
Ending Date .............. NOV-04-2012 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:00:30
Dry Time Step ............ 00:01:00
Routing Time Step ........ 30.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.236        87.680
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.058        21.504
Surface Runoff ...........         0.175        65.172
Final Surface Storage ....         0.003         1.005
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.175         1.752
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.518         5.184
External Outflow .........         0.674         6.741
Internal Outflow .........         0.000         0.000
Storage Losses ...........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.019         0.194
Continuity Error (%) .....         0.009
```

****
Time-Step Critical Elements
****
Link C2 (90.60%)
Link C60 (9.27%)
****
Highest Flow Instability Indexes
****
Link C49 (1)
****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 4.31 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S9	87.68	0.00	0.00	50.35	36.07	0.02	2.09	0.411
S23	87.68	0.00	0.00	5.52	81.34	0.16	15.13	0.928
S26	87.68	0.00	0.00	5.53	81.15	0.17	16.01	0.926
S27	87.68	0.00	0.00	38.13	48.28	0.02	1.82	0.551
S28	87.68	0.00	0.00	48.57	39.06	0.02	1.99	0.446
S29	87.68	0.00	0.00	38.12	48.29	0.02	2.46	0.551
S30	87.68	0.00	0.00	7.28	79.58	0.16	14.80	0.908
S33	87.68	0.00	0.00	5.53	81.15	0.46	42.00	0.926
S37	87.68	0.00	0.00	38.13	48.29	0.03	3.57	0.551
S38	87.68	0.00	0.00	50.35	36.07	0.02	2.19	0.411
S39	87.68	0.00	0.00	38.12	48.29	0.02	2.71	0.551
S40	87.68	0.00	0.00	50.35	36.07	0.02	1.93	0.411
S43	87.68	0.00	0.00	38.11	48.30	0.01	1.02	0.551
S44	87.68	0.00	0.00	50.35	36.07	0.02	2.50	0.411
S45	87.68	0.00	0.00	5.53	81.15	0.12	11.44	0.926
S46	87.68	0.00	0.00	38.11	48.30	0.01	1.47	0.551
S47	87.68	0.00	0.00	50.35	36.07	0.02	2.25	0.411
S48	87.68	0.00	0.00	38.12	48.29	0.02	2.43	0.551
S49	87.68	0.00	0.00	50.35	36.07	0.02	2.01	0.411
S50	87.68	0.00	0.00	5.53	81.15	0.08	7.70	0.926
S51	87.68	0.00	0.00	5.53	81.15	0.13	11.61	0.926
S55	87.68	0.00	0.00	36.83	50.80	0.05	5.40	0.579
S56	87.68	0.00	0.00	50.35	36.07	0.04	4.41	0.411
S63	87.68	0.00	0.00	36.83	50.80	0.01	0.95	0.579
S64	87.68	0.00	0.00	49.98	36.43	0.00	0.41	0.416
S65	87.68	0.00	0.00	38.12	48.29	0.02	2.52	0.551
S66	87.68	0.00	0.00	50.35	36.07	0.02	1.71	0.411
S67	87.68	0.00	0.00	50.35	36.07	0.01	1.58	0.411
S68	87.68	0.00	0.00	38.13	48.28	0.03	2.93	0.551

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.37	0.82	40.94	0 06:14
J19	JUNCTION	0.09	0.18	41.18	0 03:24
J20	JUNCTION	0.21	0.34	41.34	0 03:24
J21	JUNCTION	0.11	0.17	41.48	0 03:24
J24	JUNCTION	0.07	0.26	40.95	0 06:10
J26	JUNCTION	0.09	0.37	40.94	0 06:13
J27	JUNCTION	0.35	0.77	40.94	0 06:14
J28	JUNCTION	0.34	0.77	40.94	0 06:14
J30	JUNCTION	0.00	0.06	41.57	0 03:36
J33	JUNCTION	0.00	0.09	41.28	0 03:36
J34	JUNCTION	0.04	0.11	41.04	0 03:26

J45	JUNCTION	0.10	0.13	41.83	0	00:08
J46	JUNCTION	0.00	0.00	41.90	0	00:00
Out1	OUTFALL	0.11	0.12	40.24	0	01:56
1	STORAGE	0.36	0.77	40.94	0	06:14

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	0.00	25.66	0 01:57	0.000	6.742
J19	JUNCTION	19.77	72.63	0 03:23	0.210	5.774
J20	JUNCTION	19.29	53.45	0 03:23	0.203	5.580
J21	JUNCTION	19.31	34.31	0 03:23	0.203	5.385
J24	JUNCTION	15.07	86.29	0 04:39	0.158	2.644
J26	JUNCTION	15.09	39.10	0 04:40	0.158	0.672
J27	JUNCTION	12.09	53.25	0 05:15	0.124	6.763
J28	JUNCTION	1.36	32.03	0 05:18	0.013	6.744
J30	JUNCTION	4.47	4.47	0 03:23	0.041	0.041
J33	JUNCTION	5.70	9.99	0 03:35	0.052	0.093
J34	JUNCTION	4.59	66.14	0 03:24	0.042	3.647
J45	JUNCTION	15.00	15.00	0 00:00	5.184	5.184
J46	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
Out1	OUTFALL	0.00	25.00	0 01:56	0.000	6.741
1	STORAGE	51.70	206.97	0 04:34	0.548	6.935

****
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
J1	JUNCTION	37.44	0.452	0.383

****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.461	33	0	1.318	94	0 06:14	85.99

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	99.87	20.51	25.00	6.741
System	99.87	20.51	25.00	6.741

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	25.00	0 01:56	0.73	4.74	0.69
C30	CONDUIT	31.47	0 05:18	0.08	0.27	0.97
C36	CONDUIT	4.34	0 03:36	0.10	0.02	0.15

C37	CONDUIT	9.82	0	03:36	0.16	0.05	0.20
C38	CONDUIT	65.74	0	03:26	0.21	0.03	0.51
C49	CONDUIT	104.08	0	04:38	0.89	0.05	0.51
C51	CONDUIT	52.15	0	03:24	0.73	0.07	0.15
C52	CONDUIT	28.23	0	04:34	0.32	0.02	0.57
C53	CONDUIT	40.10	0	05:15	0.25	1.04	0.77
C60	CONDUIT	25.66	0	01:57	0.74	4.87	1.00
C61	CONDUIT	10.01	0	05:08	0.09	0.08	0.84
C62	CONDUIT	9.14	0	04:46	0.11	0.07	0.63
C63	CONDUIT	23.21	0	04:23	0.24	0.11	0.37
C64	CONDUIT	52.89	0	03:24	0.23	2.78	0.37
C65	CONDUIT	34.16	0	03:24	0.22	0.06	0.37
C66	CONDUIT	19.01	0	00:13	0.32	0.03	0.19
C67	CONDUIT	0.00	0	00:00	0.00	0.00	0.06

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
		--- Fraction of Time in Flow Class ----							
C2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.49	0.0001
C30	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0003
C36	1.00	0.31	0.16	0.00	0.53	0.00	0.00	0.00	0.03	0.0000
C37	1.00	0.00	0.31	0.00	0.69	0.00	0.00	0.00	0.01	0.0000
C38	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000
C49	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.09	0.0002
C51	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.67	0.0000
C52	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0001
C53	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.12	0.0027
C60	1.00	0.00	0.00	0.00	0.54	0.00	0.00	0.46	0.33	0.0003
C61	1.00	0.00	0.00	0.00	0.47	0.00	0.00	0.52	0.06	0.0004
C62	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0003
C63	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.18	0.0000
C64	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.14	0.0001
C65	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.12	0.0000
C66	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.24	0.0000
C67	1.00	0.47	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.0000

****
Conduit Surcharge Summary
****

Conduit	Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
	--------- Hours Full --------				
C2	0.01	0.01	0.01	94.63	0.01
C53	0.01	0.01	0.01	0.04	0.01
C60	37.44	37.44	37.44	94.63	37.44
C64	0.01	0.01	0.01	5.21	0.01

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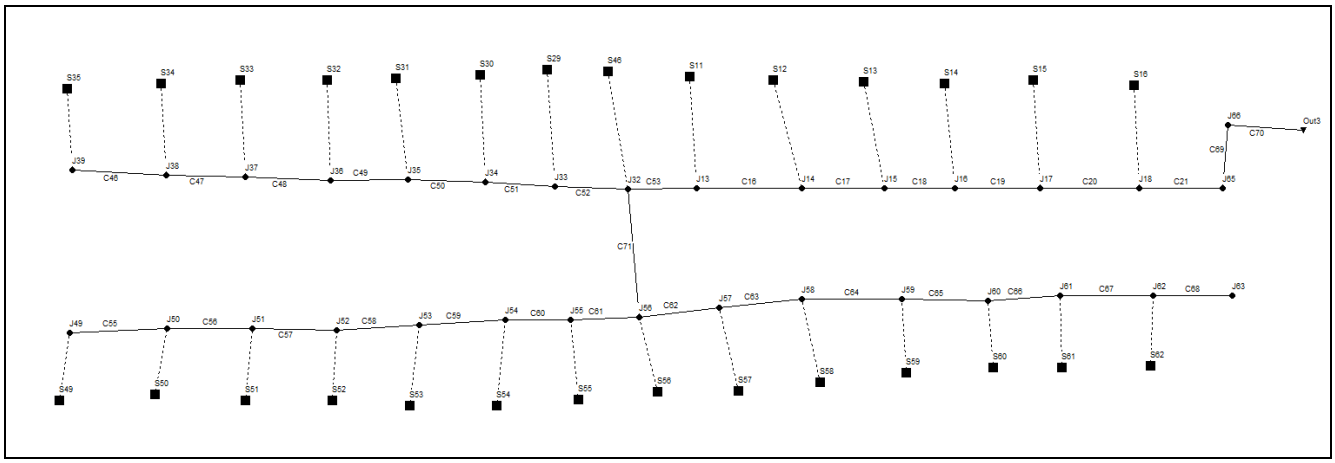


- Durata 0.5h – T_R50anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-15-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:01
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 28
Number of nodes ........... 32
Number of links ........... 31
Number of pollutants ...... 0
Number of land uses ....... 0
****************
Raingage Summary
****************
                            Data      Recording
Name            Data Source       Type      Interval
----------------------------------------------------------
Gage1           TR50est-30'       VOLUME      1 min.
********************
Subcatchment Summary
********************
Name                 Area    Width   %Imperv   %Slope   Rain Gage          Outlet
----------------------------------------------------------------------------------------------
```

S11	0.01	10.00	100.00	2.5000	Gage1	J13
S12	0.01	10.00	100.00	2.5000	Gage1	J14
S13	0.01	10.00	100.00	2.5000	Gage1	J15
S14	0.01	10.00	100.00	2.5000	Gage1	J16
S15	0.01	10.00	100.00	2.5000	Gage1	J17
S16	0.01	10.00	100.00	2.5000	Gage1	J18
S29	0.01	10.00	100.00	2.5000	Gage1	J33
S30	0.01	10.00	100.00	2.5000	Gage1	J34
S31	0.01	10.00	100.00	2.5000	Gage1	J35
S32	0.01	10.00	100.00	2.5000	Gage1	J36
S33	0.01	10.00	100.00	2.5000	Gage1	J37
S34	0.01	10.00	100.00	2.5000	Gage1	J38
S35	0.01	10.00	100.00	2.5000	Gage1	J39
S46	0.01	10.00	100.00	2.5000	Gage1	J32
S49	0.01	10.00	100.00	2.5000	Gage1	J49
S50	0.01	10.00	100.00	2.5000	Gage1	J50
S51	0.01	10.00	100.00	2.5000	Gage1	J51
S52	0.01	10.00	100.00	2.5000	Gage1	J52
S53	0.01	10.00	100.00	2.5000	Gage1	J53
S54	0.01	10.00	100.00	2.5000	Gage1	J54
S55	0.01	10.00	100.00	2.5000	Gage1	J55
S56	0.01	10.00	100.00	2.5000	Gage1	J56
S57	0.01	10.00	100.00	2.5000	Gage1	J57
S58	0.01	10.00	100.00	2.5000	Gage1	J58
S59	0.01	10.00	100.00	2.5000	Gage1	J59
S60	0.01	10.00	100.00	2.5000	Gage1	J60
S61	0.01	10.00	100.00	2.5000	Gage1	J61
S62	0.01	10.00	100.00	2.5000	Gage1	J62

****

Node Summary

****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J13	JUNCTION	43.42	0.50	100.0	
J14	JUNCTION	43.40	0.50	100.0	
J15	JUNCTION	43.38	0.50	100.0	
J16	JUNCTION	43.36	0.50	100.0	
J17	JUNCTION	43.34	0.50	100.0	
J18	JUNCTION	43.32	0.50	100.0	
J32	JUNCTION	43.44	0.50	100.0	
J33	JUNCTION	43.46	0.50	100.0	
J34	JUNCTION	43.48	0.50	100.0	
J35	JUNCTION	43.50	0.50	100.0	
J36	JUNCTION	43.52	0.50	100.0	
J37	JUNCTION	43.54	0.50	100.0	
J38	JUNCTION	43.56	0.50	100.0	
J39	JUNCTION	43.58	0.50	100.0	
J49	JUNCTION	43.63	0.50	100.0	
J50	JUNCTION	43.61	0.50	100.0	
J51	JUNCTION	43.59	0.50	100.0	
J52	JUNCTION	43.57	0.50	100.0	
J53	JUNCTION	43.55	0.50	100.0	
J54	JUNCTION	43.53	0.50	100.0	
J55	JUNCTION	43.51	0.50	100.0	
J56	JUNCTION	43.49	0.50	100.0	
J57	JUNCTION	43.51	0.50	100.0	
J58	JUNCTION	43.53	0.50	100.0	
J59	JUNCTION	43.55	0.50	100.0	
J60	JUNCTION	43.57	0.50	100.0	
J61	JUNCTION	43.59	0.50	100.0	
J62	JUNCTION	43.61	0.50	100.0	
J63	JUNCTION	43.63	0.50	100.0	
J65	JUNCTION	43.30	0.50	100.0	
J66	JUNCTION	43.25	0.55	100.0	
Out3	OUTFALL	43.25	0.30	0.0	

****

Link Summary

****

Name	From Node	To Node	Type	Length	%Slope	Roughness
C16	J13	J14	CONDUIT	10.0	0.2000	0.0125
C17	J14	J15	CONDUIT	10.0	0.2000	0.0125

C18	J15	J16	CONDUIT	10.0	0.2000	0.0125
C19	J16	J17	CONDUIT	10.0	0.2000	0.0125
C20	J17	J18	CONDUIT	10.0	0.2000	0.0125
C21	J18	J65	CONDUIT	10.0	0.2000	0.0125
C46	J39	J38	CONDUIT	10.0	0.2000	0.0125
C47	J38	J37	CONDUIT	10.0	0.2000	0.0125
C48	J37	J36	CONDUIT	10.0	0.2000	0.0125
C49	J36	J35	CONDUIT	10.0	0.2000	0.0125
C50	J35	J34	CONDUIT	10.0	0.2000	0.0125
C51	J34	J33	CONDUIT	10.0	0.2000	0.0125
C52	J33	J32	CONDUIT	10.0	0.2000	0.0125
C53	J32	J13	CONDUIT	10.0	0.2000	0.0125
C55	J49	J50	CONDUIT	10.0	0.2000	0.0125
C56	J50	J51	CONDUIT	10.0	0.2000	0.0125
C57	J51	J52	CONDUIT	10.0	0.2000	0.0125
C58	J52	J53	CONDUIT	10.0	0.2000	0.0125
C59	J53	J54	CONDUIT	10.0	0.2000	0.0125
C60	J54	J55	CONDUIT	10.0	0.2000	0.0125
C61	J55	J56	CONDUIT	10.0	0.2000	0.0125
C62	J57	J56	CONDUIT	10.0	0.2000	0.0125
C63	J58	J57	CONDUIT	10.0	0.2000	0.0125
C64	J59	J58	CONDUIT	10.0	0.2000	0.0125
C65	J60	J59	CONDUIT	10.0	0.2000	0.0125
C66	J61	J60	CONDUIT	10.0	0.2000	0.0125
C67	J62	J61	CONDUIT	10.0	0.2000	0.0125
C68	J63	J62	CONDUIT	10.0	0.2000	0.0125
C69	J65	J66	CONDUIT	10.0	0.0030	0.0200
C70	J66	Out3	CONDUIT	10.0	0.0030	0.0125
C71	J56	J32	CONDUIT	16.0	0.3125	0.0125

****

Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C16	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C17	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C18	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C19	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C20	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C21	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C46	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C47	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C48	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C49	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C50	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C51	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C52	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C53	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C55	TRAPEZOIDAL	0.50	0.50	0.26	1.50	1	731.01
C56	TRAPEZOIDAL	0.50	0.50	0.26	1.50	1	731.01
C57	TRAPEZOIDAL	0.50	0.50	0.26	1.50	1	731.01
C58	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C59	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C60	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C61	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C62	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C63	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C64	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C65	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C66	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C67	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C68	CIRCULAR	0.50	0.20	0.12	0.50	1	175.63
C69	CIRCULAR	0.50	0.20	0.12	0.50	1	13.55
C70	CIRCULAR	0.30	0.07	0.07	0.30	1	5.55
C71	CIRCULAR	0.50	0.20	0.12	0.50	1	219.54

****

Transect Summary
****

Transect SezTipo
Area:

0.0044	0.0088	0.0134	0.0179	0.0225
0.0272	0.0320	0.0368	0.0416	0.0465

```
        0.0515   0.0566   0.0616   0.0668   0.0720
        0.0773   0.0826   0.0880   0.0934   0.0989
        0.1045   0.1101   0.1158   0.1215   0.1273
        0.1343   0.1436   0.1552   0.1692   0.1855
        0.2041   0.2250   0.2483   0.2739   0.3018
        0.3321   0.3647   0.3996   0.4368   0.4764
        0.5183   0.5625   0.6090   0.6579   0.7091
        0.7626   0.8185   0.8767   0.9372   1.0000
Hrad:
        0.0659   0.1286   0.1884   0.2457   0.3005
        0.3532   0.4038   0.4525   0.4995   0.5449
        0.5888   0.6313   0.6725   0.7125   0.7514
        0.7892   0.8261   0.8620   0.8970   0.9312
        0.9646   0.9973   1.0293   1.0606   1.0914
        0.8835   0.7665   0.6971   0.6558   0.6323
        0.6210   0.6182   0.6218   0.6302   0.6422
        0.6572   0.6745   0.6937   0.7145   0.7367
        0.7599   0.7841   0.8092   0.8349   0.8613
        0.8882   0.9155   0.9433   0.9715   1.0000
Width:
        0.0691   0.0700   0.0709   0.0718   0.0727
        0.0736   0.0745   0.0755   0.0764   0.0773
        0.0782   0.0791   0.0800   0.0809   0.0818
        0.0827   0.0836   0.0845   0.0855   0.0864
        0.0873   0.0882   0.0891   0.0900   0.0909
        0.1273   0.1636   0.2000   0.2364   0.2727
        0.3091   0.3455   0.3818   0.4182   0.4545
        0.4909   0.5273   0.5636   0.6000   0.6364
        0.6727   0.7091   0.7455   0.7818   0.8182
        0.8545   0.8909   0.9273   0.9636   1.0000
********************
Control Actions Taken
********************
**************************          Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************    ---------       -------
Total Precipitation ......        0.010        49.422
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.010        48.469
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....        0.000
**************************          Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.010         0.095
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.009         0.095
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
***************************
Time-Step Critical Elements
***************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S11	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S12	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S13	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S14	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S15	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S16	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S29	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S30	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S31	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S32	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S33	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S34	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S35	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S46	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S49	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S50	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S51	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S52	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S53	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S54	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S55	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S56	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S57	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S58	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S59	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S60	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S61	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981
S62	49.42	0.00	0.00	0.00	48.47	0.00	3.73	0.981

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J13	JUNCTION	0.00	0.37	43.79	0 00:26
J14	JUNCTION	0.00	0.39	43.79	0 00:26
J15	JUNCTION	0.00	0.41	43.79	0 00:26
J16	JUNCTION	0.00	0.43	43.79	0 00:26
J17	JUNCTION	0.01	0.45	43.79	0 00:26
J18	JUNCTION	0.01	0.47	43.79	0 00:26
J32	JUNCTION	0.00	0.35	43.79	0 00:25
J33	JUNCTION	0.00	0.33	43.79	0 00:25
J34	JUNCTION	0.00	0.31	43.79	0 00:25
J35	JUNCTION	0.00	0.29	43.79	0 00:25
J36	JUNCTION	0.00	0.27	43.79	0 00:25
J37	JUNCTION	0.00	0.25	43.79	0 00:26
J38	JUNCTION	0.00	0.23	43.79	0 00:25
J39	JUNCTION	0.00	0.21	43.79	0 00:25
J49	JUNCTION	0.00	0.16	43.79	0 00:24
J50	JUNCTION	0.00	0.18	43.79	0 00:24
J51	JUNCTION	0.00	0.20	43.79	0 00:24
J52	JUNCTION	0.00	0.22	43.79	0 00:24
J53	JUNCTION	0.00	0.24	43.79	0 00:24
J54	JUNCTION	0.00	0.26	43.79	0 00:25
J55	JUNCTION	0.00	0.28	43.79	0 00:25
J56	JUNCTION	0.00	0.30	43.79	0 00:25
J57	JUNCTION	0.00	0.28	43.79	0 00:25
J58	JUNCTION	0.00	0.26	43.79	0 00:26
J59	JUNCTION	0.00	0.24	43.79	0 00:26
J60	JUNCTION	0.00	0.22	43.79	0 00:26
J61	JUNCTION	0.00	0.20	43.79	0 00:26
J62	JUNCTION	0.00	0.18	43.79	0 00:27
J63	JUNCTION	0.00	0.16	43.79	0 00:27
J65	JUNCTION	0.01	0.49	43.79	0 00:26

J66	JUNCTION	0.01	0.54	43.79	0	00:26
Out3	OUTFALL	0.00	0.15	43.40	0	00:11

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J13	JUNCTION	3.73	55.68	0	00:14	0.003	0.078
J14	JUNCTION	3.73	56.20	0	00:14	0.003	0.081
J15	JUNCTION	3.73	56.23	0	00:13	0.003	0.085
J16	JUNCTION	3.73	55.94	0	00:13	0.003	0.088
J17	JUNCTION	3.73	55.26	0	00:13	0.003	0.092
J18	JUNCTION	3.73	54.40	0	00:12	0.003	0.095
J32	JUNCTION	3.73	55.26	0	00:14	0.003	0.075
J33	JUNCTION	3.73	22.24	0	00:18	0.003	0.024
J34	JUNCTION	3.73	19.77	0	00:18	0.003	0.020
J35	JUNCTION	3.73	16.95	0	00:18	0.003	0.017
J36	JUNCTION	3.73	13.74	0	00:18	0.003	0.014
J37	JUNCTION	3.73	10.31	0	00:18	0.003	0.010
J38	JUNCTION	3.73	6.74	0	00:15	0.003	0.007
J39	JUNCTION	3.73	3.73	0	00:16	0.003	0.003
J49	JUNCTION	3.73	3.73	0	00:16	0.003	0.003
J50	JUNCTION	3.73	6.95	0	00:15	0.003	0.007
J51	JUNCTION	3.73	9.74	0	00:15	0.003	0.010
J52	JUNCTION	3.73	12.31	0	00:15	0.003	0.014
J53	JUNCTION	3.73	15.01	0	00:15	0.003	0.017
J54	JUNCTION	3.73	17.60	0	00:15	0.003	0.020
J55	JUNCTION	3.73	19.89	0	00:15	0.003	0.024
J56	JUNCTION	3.73	38.10	0	00:14	0.003	0.048
J57	JUNCTION	3.73	17.37	0	00:15	0.003	0.020
J58	JUNCTION	3.73	15.02	0	00:15	0.003	0.017
J59	JUNCTION	3.73	12.44	0	00:15	0.003	0.014
J60	JUNCTION	3.73	9.64	0	00:15	0.003	0.010
J61	JUNCTION	3.73	6.59	0	00:15	0.003	0.007
J62	JUNCTION	3.73	5.11	0	00:17	0.003	0.004
J63	JUNCTION	0.00	2.14	0	00:17	0.000	0.000
J65	JUNCTION	0.00	50.30	0	00:12	0.000	0.095
J66	JUNCTION	0.00	46.07	0	00:12	0.000	0.095
Out3	OUTFALL	0.00	40.00	0	00:11	0.000	0.095

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	4.30	13.03	40.00	0.095
System	4.30	13.03	40.00	0.095

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	52.93	0	00:14	0.71	0.30	0.76
C17	CONDUIT	53.06	0	00:13	0.71	0.30	0.80
C18	CONDUIT	52.83	0	00:13	0.70	0.30	0.84

C19	CONDUIT	52.31	0	00:13	0.68	0.30	0.88
C20	CONDUIT	51.46	0	00:12	0.66	0.29	0.92
C21	CONDUIT	50.30	0	00:12	0.62	0.29	0.96
C46	CONDUIT	3.49	0	00:18	0.22	0.02	0.44
C47	CONDUIT	7.08	0	00:18	0.30	0.04	0.48
C48	CONDUIT	10.49	0	00:18	0.35	0.06	0.52
C49	CONDUIT	13.71	0	00:18	0.38	0.08	0.56
C50	CONDUIT	16.52	0	00:18	0.39	0.09	0.60
C51	CONDUIT	18.99	0	00:18	0.36	0.11	0.64
C52	CONDUIT	21.16	0	00:18	0.27	0.12	0.68
C53	CONDUIT	52.31	0	00:14	0.71	0.30	0.72
C55	CONDUIT	3.24	0	00:15	0.17	0.00	0.35
C56	CONDUIT	6.02	0	00:15	0.21	0.01	0.39
C57	CONDUIT	8.60	0	00:15	0.16	0.01	0.43
C58	CONDUIT	11.32	0	00:15	0.39	0.06	0.46
C59	CONDUIT	13.93	0	00:15	0.40	0.08	0.50
C60	CONDUIT	16.31	0	00:15	0.40	0.09	0.54
C61	CONDUIT	18.52	0	00:14	0.38	0.11	0.58
C62	CONDUIT	16.13	0	00:14	0.37	0.09	0.58
C63	CONDUIT	13.86	0	00:14	0.39	0.08	0.54
C64	CONDUIT	11.40	0	00:15	0.38	0.06	0.50
C65	CONDUIT	8.76	0	00:15	0.35	0.05	0.46
C66	CONDUIT	5.94	0	00:15	0.30	0.03	0.42
C67	CONDUIT	3.16	0	00:28	0.21	0.02	0.38
C68	CONDUIT	2.14	0	00:17	0.09	0.01	0.34
C69	CONDUIT	46.07	0	00:12	0.68	3.40	0.98
C70	CONDUIT	40.00	0	00:11	0.93	7.20	0.76
C71	CONDUIT	35.82	0	00:14	0.57	0.16	0.65

****
Flow Classification Summary
****

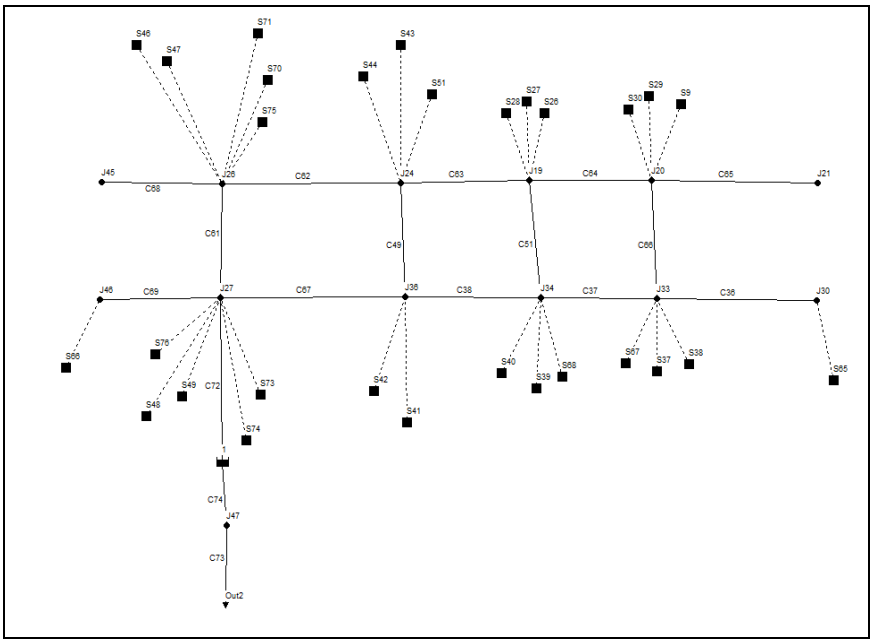
Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C17	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.03	0.0000
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C19	1.00	0.00	0.06	0.00	0.94	0.00	0.00	0.03	0.0000
C20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C21	1.00	0.00	0.75	0.00	0.25	0.00	0.00	0.01	0.0000
C46	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.0000
C47	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C48	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C49	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C50	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C51	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C52	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C53	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C55	1.00	0.91	0.03	0.00	0.06	0.00	0.00	0.01	0.0000
C56	1.00	0.89	0.03	0.00	0.08	0.00	0.00	0.01	0.0000
C57	1.00	0.00	0.89	0.00	0.11	0.00	0.00	0.01	0.0000
C58	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000
C59	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000
C60	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000
C61	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000
C62	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C63	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C64	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C65	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C66	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C67	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C68	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.0000
C69	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.02	0.0000
C70	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0001
C71	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000

****
Conduit Surcharge Summary
****

	--------- Hours Full --------	Hours Above Full	Hours Capacity

Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
C69	0.01	0.01	0.01	0.66	0.01
C70	0.01	0.01	0.01	0.72	0.01

TORRENTE QUARESIMO



- Durata 24h – T_R50anni

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ OCT-31-2012 00:00:00
Ending Date .............. NOV-04-2012 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:00:30
Dry Time Step ............ 00:01:00
Routing Time Step ........ 30.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.299       117.000
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.074        28.847
Surface Runoff ...........         0.222        86.974
Final Surface Storage ....         0.003         1.179
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
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  Wet Weather Inflow .....        0.222        2.223
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow ..............      0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.222        2.220
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.003
  Continuity Error (%) .....      0.000
  ***************************

  Time-Step Critical Elements
  ***************************
  Link C73 (95.52%)
  Link C74 (1.74%)
  *******************************
  Highest Flow Instability Indexes
  *******************************
  Link C74 (2)
  Link C72 (1)
  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step          :     1.45 sec
  Average Time Step          :     3.20 sec
  Maximum Time Step          :    30.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ***************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                     Total     Total     Total     Total     Total     Total     Peak  Runoff
                    Precip     Runon      Evap     Infil    Runoff    Runoff    Runoff   Coeff
  Subcatchment          mm        mm        mm        mm        mm    10^6 ltr     LPS
  ---------------------------------------------------------------------------------------------------
  S9                117.00      0.00      0.00     57.88     57.86      0.04     1.02   0.494
  S26               117.00      0.00      0.00      8.23    107.75      0.11     2.43   0.921
  S27               117.00      0.00      0.00     38.20     77.48      0.06     1.46   0.662
  S28               117.00      0.00      0.00     57.88     57.86      0.04     1.02   0.494
  S29               117.00      0.00      0.00     38.20     77.45      0.07     1.92   0.662
  S30               117.00      0.00      0.00      8.23    107.75      0.10     2.37   0.921
  S37               117.00      0.00      0.00     38.20     77.45      0.07     1.92   0.662
  S38               117.00      0.00      0.00     57.88     57.86      0.04     1.02   0.494
  S39               117.00      0.00      0.00     38.20     77.46      0.06     1.67   0.662
  S40               117.00      0.00      0.00     57.88     57.86      0.04     1.02   0.494
  S41               117.00      0.00      0.00     38.20     77.51      0.05     1.34   0.662
  S42               117.00      0.00      0.00     57.88     57.86      0.04     1.14   0.494
  S43               117.00      0.00      0.00     38.20     77.51      0.05     1.33   0.662
  S44               117.00      0.00      0.00     57.88     57.86      0.04     1.14   0.494
  S46               117.00      0.00      0.00     38.20     77.46      0.05     1.31   0.662
  S47               117.00      0.00      0.00     57.88     57.86      0.01     0.39   0.494
  S48               117.00      0.00      0.00     38.20     77.47      0.03     0.90   0.662
  S49               117.00      0.00      0.00     57.88     57.86      0.01     0.39   0.494
  S51               117.00      0.00      0.00      8.23    107.75      0.28     6.50   0.921
  S65               117.00      0.00      0.00      8.23    107.75      0.05     1.18   0.921
  S66               117.00      0.00      0.00      8.23    107.75      0.06     1.43   0.921
  S67               117.00      0.00      0.00      8.23    107.75      0.10     2.37   0.921
  S68               117.00      0.00      0.00      8.23    107.75      0.11     2.43   0.921
  S70               117.00      0.00      0.00     42.60     73.13      0.06     1.57   0.625
  S71               117.00      0.00      0.00     38.20     77.45      0.09     2.36   0.662
  S73               117.00      0.00      0.00     42.60     73.13      0.06     1.57   0.625
  S74               117.00      0.00      0.00     38.20     77.47      0.10     2.62   0.662
  S75               117.00      0.00      0.00      8.23    107.75      0.31     7.20   0.921
  S76               117.00      0.00      0.00      8.23    107.75      0.09     1.99   0.921
  *****************
  Node Depth Summary
  *****************
  -----------------------------------------------------------------------
                         Average  Maximum  Maximum  Time of Max
                           Depth    Depth      HGL   Occurrence
  Node          Type       Meters   Meters   Meters  days hr:min
  -----------------------------------------------------------------------
```

J19	JUNCTION	0.18	0.45	41.62	0	23:11
J20	JUNCTION	0.16	0.42	41.62	0	23:11
J21	JUNCTION	0.00	0.00	41.67	0	00:00
J24	JUNCTION	0.19	0.47	41.62	0	23:11
J26	JUNCTION	0.32	0.64	41.62	0	23:12
J27	JUNCTION	0.40	0.74	41.62	0	23:12
J30	JUNCTION	0.03	0.15	41.62	0	23:11
J33	JUNCTION	0.30	0.62	41.62	0	23:10
J34	JUNCTION	0.36	0.68	41.62	0	23:12
J36	JUNCTION	0.37	0.70	41.62	0	23:12
J45	JUNCTION	0.05	0.22	41.62	0	23:12
J46	JUNCTION	0.09	0.31	41.62	0	23:12
J47	JUNCTION	0.64	1.02	41.62	0	23:13
Out2	OUTFALL	0.08	0.08	40.68	0	06:39
1	STORAGE	0.57	0.94	41.62	0	23:13

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J19	JUNCTION	4.92	5.74	0 13:34	0.198	0.270
J20	JUNCTION	5.31	5.31	0 13:35	0.212	0.212
J21	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J24	JUNCTION	8.98	10.75	0 12:13	0.374	0.497
J26	JUNCTION	12.84	52.09	0 11:41	0.523	0.731
J27	JUNCTION	7.49	253.28	0 11:40	0.292	2.897
J30	JUNCTION	1.18	1.22	0 16:31	0.051	0.051
J33	JUNCTION	5.31	10.60	0 12:18	0.212	0.405
J34	JUNCTION	5.12	16.28	0 11:43	0.206	0.758
J36	JUNCTION	2.48	32.06	0 11:42	0.092	1.200
J45	JUNCTION	0.00	0.78	0 14:42	0.000	0.005
J46	JUNCTION	1.43	10.86	0 13:41	0.062	0.087
J47	JUNCTION	0.00	34.52	0 08:58	0.000	2.230
Out2	OUTFALL	0.00	10.00	0 06:39	0.000	2.220
1	STORAGE	0.00	233.01	0 11:39	0.000	2.825

****
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
J47	JUNCTION	38.06	0.369	0.181
1	STORAGE	19.18	0.139	0.161

****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.315	49	0	0.533	84	0 23:13	162.61

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out2	98.56	9.29	10.00	2.220

System 98.56 9.29 10.00 2.220

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C36	CONDUIT	1.18	0	13:36	0.02	0.00	0.55
C37	CONDUIT	7.60	0	10:52	0.05	0.03	0.93
C38	CONDUIT	14.50	0	11:41	0.11	0.12	0.98
C49	CONDUIT	10.28	0	12:15	0.32	0.01	0.58
C51	CONDUIT	4.45	0	11:55	0.10	0.00	0.56
C61	CONDUIT	47.34	0	11:39	0.37	0.06	0.69
C62	CONDUIT	2.54	0	11:56	0.05	0.02	0.97
C63	CONDUIT	1.52	0	16:42	0.02	0.03	0.92
C64	CONDUIT	1.06	0	16:42	0.03	0.02	0.87
C65	CONDUIT	0.00	0	00:00	0.00	0.00	0.42
C66	CONDUIT	4.41	0	12:18	0.10	0.00	0.52
C67	CONDUIT	46.68	0	11:40	0.10	0.10	0.90
C68	CONDUIT	0.78	0	14:42	0.01	0.00	0.72
C69	CONDUIT	10.34	0	13:44	0.03	0.00	0.65
C72	CONDUIT	233.01	0	11:39	1.10	0.17	0.96
C73	CONDUIT	10.00	0	06:39	0.67	3.75	0.71
C74	CONDUIT	34.52	0	08:58	0.61	0.10	1.00

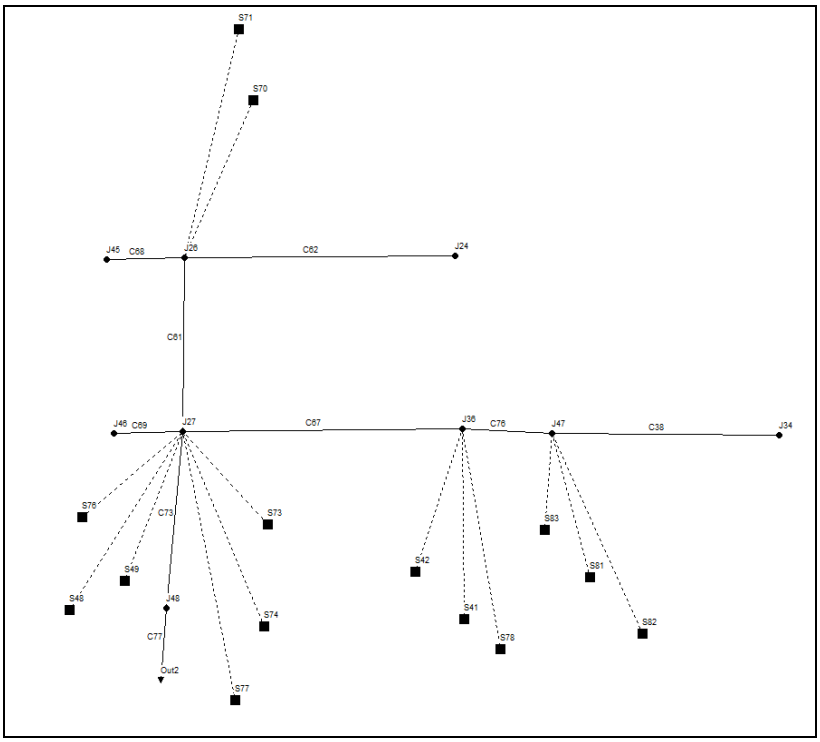
****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C36	1.00	0.00	0.08	0.00	0.92	0.00	0.00	0.00	0.00	0.0000
C37	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C38	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
C49	1.00	0.00	0.08	0.00	0.92	0.00	0.00	0.00	0.03	0.0000
C51	1.00	0.00	0.10	0.00	0.90	0.00	0.00	0.00	0.01	0.0000
C61	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.05	0.0001
C62	1.00	0.02	0.06	0.00	0.92	0.00	0.00	0.00	0.01	0.0000
C63	1.00	0.08	0.02	0.00	0.90	0.00	0.00	0.00	0.01	0.0000
C64	1.00	0.10	0.03	0.00	0.87	0.00	0.00	0.00	0.01	0.0000
C65	1.00	0.13	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C66	1.00	0.00	0.13	0.00	0.87	0.00	0.00	0.00	0.02	0.0000
C67	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0001
C68	1.00	0.02	0.46	0.00	0.52	0.00	0.00	0.00	0.00	0.0000
C69	1.00	0.00	0.26	0.00	0.73	0.00	0.00	0.00	0.00	0.0000
C72	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.11	0.0005
C73	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.39	0.0001
C74	1.00	0.00	0.00	0.00	0.89	0.00	0.00	0.10	0.12	0.0010

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C73	0.01	0.01	0.01	62.06	0.01
C74	35.96	35.96	35.97	0.01	0.01

FOSSETTA DELLA TORRETTA EST



- Durata 6h – T_R50anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date OCT-31-2012 00:00:00
Ending Date NOV-04-2012 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Wet Time Step 00:00:30
Dry Time Step 00:01:00
Routing Time Step ..... 30.00 sec

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.089	87.458
Evaporation Loss	0.000	0.000
Infiltration Loss	0.023	22.962
Surface Runoff	0.064	63.273
Final Surface Storage	0.001	1.224
Continuity Error (%)	0.000	

```
**************************        Volume         Volume
Flow Routing Continuity          hectare-m       10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......          0.000          0.000
Wet Weather Inflow .......          0.064          0.644
Groundwater Inflow .......          0.000          0.000
RDII Inflow ..............          0.000          0.000
External Inflow ..........          0.000          0.000
External Outflow .........          0.064          0.644
Internal Outflow .........          0.000          0.000
Storage Losses ...........          0.000          0.000
Initial Stored Volume ....          0.000          0.000
Final Stored Volume ......          0.000          0.000
Continuity Error (%) .....          0.000
***************************
Time-Step Critical Elements
***************************
Link C77 (93.86%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     0.50 sec
Average Time Step          :     2.35 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S41	87.46	0.00	0.00	28.59	57.45	0.03	2.97	0.657
S42	87.46	0.00	0.00	49.98	36.21	0.01	0.80	0.414
S48	87.46	0.00	0.00	28.56	57.46	0.00	0.45	0.657
S49	87.46	0.00	0.00	49.91	36.28	0.00	0.32	0.415
S70	87.46	0.00	0.00	49.90	36.29	0.02	2.53	0.415
S71	87.46	0.00	0.00	28.57	57.46	0.08	8.19	0.657
S73	87.46	0.00	0.00	49.90	36.29	0.02	2.03	0.415
S74	87.46	0.00	0.00	28.57	57.46	0.05	5.66	0.657
S76	87.46	0.00	0.00	7.36	79.08	0.02	2.20	0.904
S77	87.46	0.00	0.00	7.36	79.08	0.13	12.10	0.904
S78	87.46	0.00	0.00	7.36	79.08	0.06	5.28	0.904
S81	87.46	0.00	0.00	28.54	57.50	0.06	6.73	0.657
S82	87.46	0.00	0.00	7.37	79.06	0.13	11.88	0.904
S83	87.46	0.00	0.00	37.37	48.90	0.02	2.25	0.559

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J24	JUNCTION	0.15	0.43	39.17	0 05:48
J26	JUNCTION	0.18	0.48	39.17	0 05:49
J27	JUNCTION	0.41	0.78	39.17	0 05:50
J34	JUNCTION	0.20	0.51	39.17	0 05:48
J36	JUNCTION	0.42	0.78	39.17	0 05:48
J45	JUNCTION	0.18	0.47	39.17	0 05:49
J46	JUNCTION	0.41	0.77	39.17	0 05:50
J47	JUNCTION	0.39	0.75	39.17	0 05:49
J48	JUNCTION	0.50	0.88	39.17	0 05:50
Out2	OUTFALL	0.07	0.08	38.37	0 01:33

```
*******************
Node Inflow Summary
*******************
```

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J24	JUNCTION	0.00	5.07	0 03:19	0.000	0.023
J26	JUNCTION	10.72	11.74	0 03:20	0.102	0.129
J27	JUNCTION	22.75	28.21	0 02:52	0.234	0.689
J34	JUNCTION	0.00	9.31	0 02:58	0.000	0.057
J36	JUNCTION	9.05	12.74	0 03:16	0.093	0.313
J45	JUNCTION	0.00	0.78	0 02:54	0.000	0.004
J46	JUNCTION	0.00	2.70	0 17:06	0.000	0.019
J47	JUNCTION	20.86	20.86	0 03:24	0.215	0.273
J48	JUNCTION	0.00	35.57	0 16:07	0.000	0.665
Out2	OUTFALL	0.00	10.00	0 01:33	0.000	0.644

****
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
J48	JUNCTION	7.82	0.229	0.121

****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out2	94.48	9.11	10.00	0.644
System	94.48	9.11	10.00	0.644

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C38	CONDUIT	9.31	0 02:58	0.03	0.00	0.39
C61	CONDUIT	8.40	0 02:52	0.09	0.00	0.52
C62	CONDUIT	5.07	0 03:19	0.07	0.01	0.45
C67	CONDUIT	7.41	0 17:28	0.04	0.07	0.60
C68	CONDUIT	0.78	0 02:54	0.03	0.00	0.47
C69	CONDUIT	3.37	0 17:11	0.02	0.00	0.60
C73	CONDUIT	35.57	0 16:07	0.58	0.11	1.00
C76	CONDUIT	5.32	0 02:25	0.06	0.00	0.48
C77	CONDUIT	10.00	0 01:33	0.76	1.68	0.71

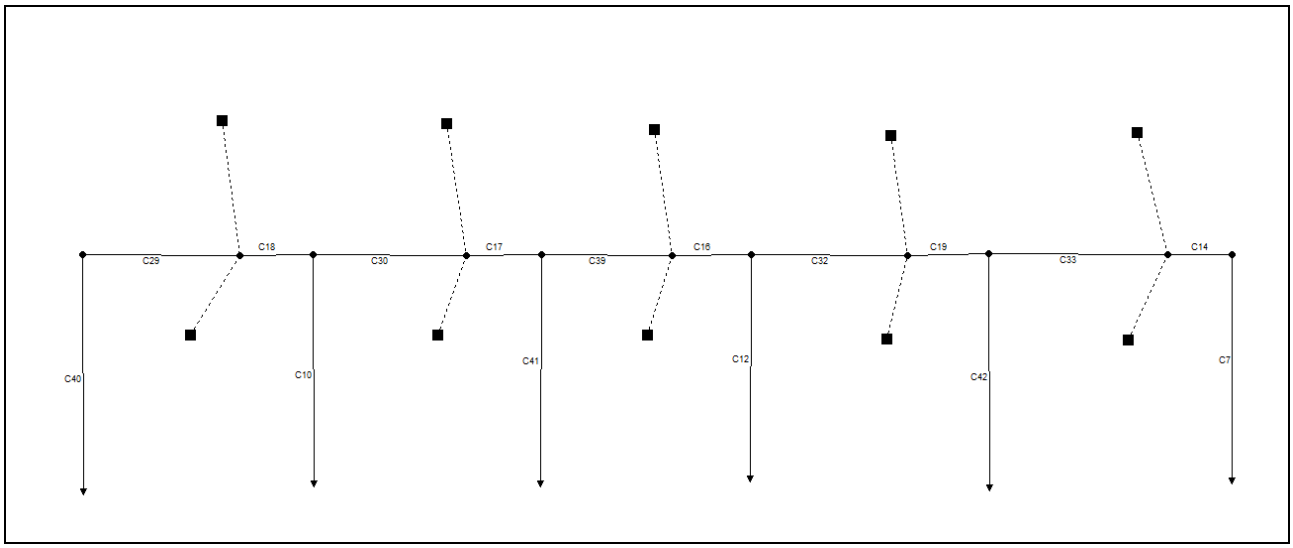
****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C38	1.00	0.03	0.09	0.00	0.88	0.00	0.00	0.00	0.0000
C61	1.00	0.00	0.04	0.00	0.96	0.00	0.00	0.01	0.0000
C62	1.00	0.00	0.09	0.00	0.91	0.00	0.00	0.02	0.0000
C67	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C68	1.00	0.04	0.03	0.00	0.94	0.00	0.00	0.00	0.0000
C69	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.0000
C73	1.00	0.00	0.00	0.00	0.83	0.00	0.00	0.17	0.15	0.0006

```
C76              1.00  0.00  0.03  0.00  0.97  0.00  0.00  0.00    0.01  0.0000
C77              1.00  0.00  0.00  0.00  0.99  0.01  0.00  0.00    0.43  0.0000
*************************
Conduit Surcharge Summary
*************************
-------------------------------------------------------------------------------
                                          Hours      Hours
                 --------- Hours Full --------   Above Full   Capacity
Conduit            Both Ends  Upstream  Dnstream   Normal Flow   Limited
-------------------------------------------------------------------------------
C73                  6.49      6.49      6.49      0.01         0.01
C77                  0.01      0.01      0.01     17.35         0.01
```

ALLEGATO 2: RISULTATI DIMENSIONAMENTO COLLETTORI DI RACCOLTA in curva per strada di categoria "b"

COLLETTORE Ø400



- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-02-2012 00:00:00
Ending Date .............. FEB-02-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:01
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.024        45.863
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.024        44.906
Final Surface Storage ....         0.001         0.958
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
```

```
  Dry Weather Inflow .....        0.000        0.000
  Wet Weather Inflow .....        0.024        0.236
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow .............       0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.024        0.236
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.000
  **************************
  Time-Step Critical Elements
  **************************
  None
  *********************************
  Highest Flow Instability Indexes
  *********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     1.00 sec
  Average Time Step           :     1.00 sec
  Maximum Time Step           :     1.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
  ***************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                      Total     Total     Total     Total     Total     Total     Peak  Runoff
                     Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
  Subcatchment          mm        mm        mm        mm        mm    10^6 ltr     CMS
  ---------------------------------------------------------------------------------------------------
  S45                 45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S46                 45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S47                 45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S48                 45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S6                  45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S7                  45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S8                  45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S9                  45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S10                 45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S11                 45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  ******************
  Node Depth Summary
  ******************
  -------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -------------------------------------------------------------------
  J5            JUNCTION      0.04     0.20     1.08     0  00:08
  J15           JUNCTION      0.05     0.23     0.93     0  00:08
  J19           JUNCTION      0.05     0.23     0.39     0  00:08
  J20           JUNCTION      0.05     0.23     0.58     0  00:08
  J21           JUNCTION      0.05     0.23     0.76     0  00:08
  J27           JUNCTION      0.03     0.14     0.14     0  00:08
  J28           JUNCTION      0.04     0.19     0.37     0  00:08
  J29           JUNCTION      0.04     0.20     0.56     0  00:08
  J30           JUNCTION      0.04     0.20     0.74     0  00:08
  J31           JUNCTION      0.03     0.19     0.91     0  00:08
  J32           JUNCTION      0.02     0.14     1.04     0  00:08
  Out1           OUTFALL      0.00     0.00    -0.97     0  00:00
  Out2           OUTFALL      0.00     0.00    -0.79     0  00:00
  Out3           OUTFALL      0.00     0.00    -0.61     0  00:00
  Out4           OUTFALL      0.00     0.00    -0.43     0  00:00
  Out5           OUTFALL      0.00     0.00    -0.25     0  00:00
  Out6           OUTFALL      0.00     0.00    -0.07     0  00:00
  *******************
  Node Inflow Summary
  *******************
```

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J5	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J15	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J19	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J20	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J21	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J27	JUNCTION	0.000	0.063	0 00:08	0.000	0.030
J28	JUNCTION	0.000	0.102	0 00:08	0.000	0.046
J29	JUNCTION	0.000	0.105	0 00:08	0.000	0.047
J30	JUNCTION	0.000	0.104	0 00:08	0.000	0.046
J31	JUNCTION	0.000	0.096	0 00:08	0.000	0.042
J32	JUNCTION	0.000	0.061	0 00:08	0.000	0.025
Out1	OUTFALL	0.000	0.061	0 00:08	0.000	0.030
Out2	OUTFALL	0.000	0.100	0 00:08	0.000	0.046
Out3	OUTFALL	0.000	0.103	0 00:08	0.000	0.047
Out4	OUTFALL	0.000	0.101	0 00:08	0.000	0.046
Out5	OUTFALL	0.000	0.093	0 00:08	0.000	0.042
Out6	OUTFALL	0.000	0.060	0 00:08	0.000	0.025

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out1	92.00	0.009	0.061	0.030
Out2	76.59	0.017	0.100	0.046
Out3	75.03	0.017	0.103	0.047
Out4	71.34	0.018	0.101	0.046
Out5	62.37	0.019	0.093	0.042
Out6	34.66	0.020	0.060	0.025
System	68.67	0.100	0.518	0.236

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C29	CONDUIT	0.063	0 00:08	1.25	0.81	0.53
C30	CONDUIT	0.059	0 00:08	0.98	0.76	0.61
C32	CONDUIT	0.057	0 00:08	0.95	0.73	0.60
C33	CONDUIT	0.047	0 00:08	0.87	0.60	0.55
C39	CONDUIT	0.059	0 00:08	0.96	0.76	0.61
C40	CONDUIT	0.061	0 00:08	1.84	0.46	0.48
C41	CONDUIT	0.103	0 00:08	2.08	0.77	0.66
C42	CONDUIT	0.093	0 00:08	2.04	0.70	0.62
C7	CONDUIT	0.060	0 00:08	1.84	0.45	0.47
C10	CONDUIT	0.100	0 00:08	2.07	0.75	0.65
C12	CONDUIT	0.101	0 00:08	2.07	0.76	0.65
C14	CONDUIT	0.061	0 00:08	1.32	0.78	0.48
C16	CONDUIT	0.047	0 00:07	0.82	0.61	0.61
C17	CONDUIT	0.047	0 00:07	0.82	0.60	0.61
C18	CONDUIT	0.044	0 00:07	0.83	0.56	0.60
C19	CONDUIT	0.050	0 00:07	0.89	0.64	0.59

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C29	1.00	0.01	0.00	0.00	0.77	0.22	0.00	0.00	0.70	0.0005
C30	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.67	0.0004
C32	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.65	0.0004
C33	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.61	0.0004
C39	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.66	0.0004
C40	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.62	0.0003
C41	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.60	0.0004
C42	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.56	0.0004
C7	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.81	0.0003
C10	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.60	0.0004
C12	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.59	0.0004
C14	1.00	0.01	0.02	0.00	0.80	0.17	0.00	0.00	0.27	0.0005
C16	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.29	0.0005
C17	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.30	0.0005
C18	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.31	0.0005
C19	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.27	0.0005

****
Conduit Surcharge Summary
****
No conduits were surcharged.

- Durata 15' – T_R25anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-02-2012 00:00:00
Ending Date FEB-02-2012 01:00:00
Antecedent Dry Days 0.0
Report Time Step 00:00:10
Wet Time Step 00:00:01
Dry Time Step 00:00:10
Routing Time Step ..... 1.00 sec

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
**********	---	---
Total Precipitation	0.018	35.028
Evaporation Loss	0.000	0.000
Infiltration Loss	0.000	0.000
Surface Runoff	0.018	34.070
Final Surface Storage	0.001	0.958
Continuity Error (%)	0.000	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
**********	---	---
Dry Weather Inflow	0.000	0.000

```
  Wet Weather Inflow .....        0.018        0.179
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow ..............      0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.018        0.179
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.000
  **************************
  Time-Step Critical Elements
  **************************
  None
  *********************************
  Highest Flow Instability Indexes
  *********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     1.00 sec
  Average Time Step           :     1.00 sec
  Maximum Time Step           :     1.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
  ***************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                      Total     Total     Total     Total     Total     Total     Peak  Runoff
                     Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
  Subcatchment           mm        mm        mm        mm        mm        mm   10^6 ltr     CMS
  ---------------------------------------------------------------------------------------------------
  S45                 35.03      0.00      0.00      0.00     34.07      0.03     0.07   0.973
  S46                 35.03      0.00      0.00      0.00     34.07      0.03     0.07   0.973
  S47                 35.03      0.00      0.00      0.00     34.07      0.03     0.07   0.973
  S48                 35.03      0.00      0.00      0.00     34.07      0.03     0.07   0.973
  S6                  35.03      0.00      0.00      0.00     34.07      0.03     0.07   0.973
  S7                  35.03      0.00      0.00      0.00     34.08      0.01     0.01   0.973
  S8                  35.03      0.00      0.00      0.00     34.08      0.01     0.01   0.973
  S9                  35.03      0.00      0.00      0.00     34.08      0.01     0.01   0.973
  S10                 35.03      0.00      0.00      0.00     34.08      0.01     0.01   0.973
  S11                 35.03      0.00      0.00      0.00     34.08      0.01     0.01   0.973
  ******************
  Node Depth Summary
  ******************
  -------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
  Node          Type       Meters   Meters   Meters  days hr:min
  -------------------------------------------------------------------
  J5          JUNCTION      0.04     0.17     1.06     0  00:08
  J15         JUNCTION      0.04     0.19     0.90     0  00:08
  J19         JUNCTION      0.04     0.20     0.36     0  00:08
  J20         JUNCTION      0.04     0.20     0.54     0  00:08
  J21         JUNCTION      0.04     0.20     0.72     0  00:08
  J27         JUNCTION      0.03     0.12     0.12     0  00:08
  J28         JUNCTION      0.03     0.16     0.34     0  00:08
  J29         JUNCTION      0.03     0.17     0.53     0  00:08
  J30         JUNCTION      0.03     0.16     0.70     0  00:08
  J31         JUNCTION      0.03     0.16     0.88     0  00:08
  J32         JUNCTION      0.02     0.12     1.02     0  00:08
  Out1        OUTFALL       0.00     0.00    -0.97     0  00:00
  Out2        OUTFALL       0.00     0.00    -0.79     0  00:00
  Out3        OUTFALL       0.00     0.00    -0.61     0  00:00
  Out4        OUTFALL       0.00     0.00    -0.43     0  00:00
  Out5        OUTFALL       0.00     0.00    -0.25     0  00:00
  Out6        OUTFALL       0.00     0.00    -0.07     0  00:00
  *******************
  Node Inflow Summary
  *******************
  ---------------------------------------------------------------------------------------
```

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J5	JUNCTION	0.082	0.082	0 00:08	0.036	0.036
J15	JUNCTION	0.082	0.082	0 00:08	0.036	0.036
J19	JUNCTION	0.082	0.082	0 00:08	0.036	0.036
J20	JUNCTION	0.082	0.082	0 00:08	0.036	0.036
J21	JUNCTION	0.082	0.082	0 00:08	0.036	0.036
J27	JUNCTION	0.000	0.049	0 00:08	0.000	0.024
J28	JUNCTION	0.000	0.078	0 00:08	0.000	0.035
J29	JUNCTION	0.000	0.080	0 00:08	0.000	0.036
J30	JUNCTION	0.000	0.079	0 00:08	0.000	0.035
J31	JUNCTION	0.000	0.073	0 00:08	0.000	0.032
J32	JUNCTION	0.000	0.045	0 00:08	0.000	0.018
Out1	OUTFALL	0.000	0.047	0 00:08	0.000	0.023
Out2	OUTFALL	0.000	0.076	0 00:08	0.000	0.035
Out3	OUTFALL	0.000	0.078	0 00:08	0.000	0.036
Out4	OUTFALL	0.000	0.077	0 00:08	0.000	0.035
Out5	OUTFALL	0.000	0.071	0 00:08	0.000	0.032
Out6	OUTFALL	0.000	0.045	0 00:08	0.000	0.018

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out1	91.42	0.007	0.047	0.023
Out2	76.01	0.013	0.076	0.035
Out3	74.48	0.013	0.078	0.036
Out4	70.76	0.014	0.077	0.035
Out5	61.82	0.014	0.071	0.032
Out6	33.94	0.015	0.045	0.018
System	68.07	0.076	0.394	0.179

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C29	CONDUIT	0.049	0 00:08	1.16	0.62	0.45
C30	CONDUIT	0.046	0 00:08	0.93	0.60	0.52
C32	CONDUIT	0.045	0 00:08	0.91	0.57	0.51
C33	CONDUIT	0.037	0 00:08	0.84	0.47	0.47
C39	CONDUIT	0.046	0 00:08	0.92	0.59	0.52
C40	CONDUIT	0.047	0 00:08	1.72	0.35	0.41
C41	CONDUIT	0.078	0 00:08	1.96	0.59	0.55
C42	CONDUIT	0.071	0 00:08	1.91	0.53	0.52
C7	CONDUIT	0.045	0 00:08	1.70	0.34	0.40
C10	CONDUIT	0.076	0 00:08	1.95	0.57	0.54
C12	CONDUIT	0.077	0 00:08	1.95	0.58	0.55
C14	CONDUIT	0.045	0 00:08	1.19	0.58	0.42
C16	CONDUIT	0.035	0 00:08	0.72	0.45	0.52
C17	CONDUIT	0.034	0 00:08	0.71	0.44	0.52
C18	CONDUIT	0.033	0 00:08	0.73	0.42	0.51
C19	CONDUIT	0.036	0 00:08	0.78	0.47	0.50

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C29	1.00	0.01	0.00	0.00	0.78	0.21	0.00	0.00	0.70	0.0004
C30	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.67	0.0003
C32	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.65	0.0003
C33	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.61	0.0003
C39	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.67	0.0003
C40	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.62	0.0002
C41	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.60	0.0003
C42	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.57	0.0003
C7	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.80	0.0002
C10	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.60	0.0003
C12	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.59	0.0003
C14	1.00	0.01	0.02	0.00	0.81	0.16	0.00	0.00	0.25	0.0004
C16	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.28	0.0003
C17	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.29	0.0003
C18	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.31	0.0003
C19	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.26	0.0003

****
Conduit Surcharge Summary
****
No conduits were surcharged.

- <u>Durata 30' – T_R100anni</u>

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-02-2012 00:00:00
Ending Date FEB-02-2012 01:00:00
Antecedent Dry Days 0.0
Report Time Step 00:00:10
Wet Time Step 00:00:01
Dry Time Step 00:00:10
Routing Time Step ..... 1.00 sec

********** Runoff Quantity Continuity **********	Volume hectare-m ---------	Depth mm -------
Total Precipitation	0.031	58.264
Evaporation Loss	0.000	0.000
Infiltration Loss	0.000	0.000
Surface Runoff	0.030	57.303
Final Surface Storage	0.001	0.962
Continuity Error (%)	0.000	

********** Flow Routing Continuity **********	Volume hectare-m ---------	Volume 10^6 ltr ---------
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.030	0.301
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000

```
External Inflow .........      0.000      0.000
External Outflow .........     0.030      0.301
Internal Outflow .........    0.000      0.000
Storage Losses ...........     0.000      0.000
Initial Stored Volume ....     0.000      0.000
Final Stored Volume ......     0.000      0.000
Continuity Error (%) .....     0.012
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :    1.00 sec
Average Time Step          :    1.00 sec
Maximum Time Step          :    1.00 sec
Percent in Steady State    :    0.00
Average Iterations per Step :   2.00
**************************
Subcatchment Runoff Summary
**************************
-----------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment        mm        mm        mm        mm        mm    10^6 ltr    CMS
-----------------------------------------------------------------------------------------------------
S45                58.26     0.00      0.00      0.00     57.30     0.05      0.06   0.983
S46                58.26     0.00      0.00      0.00     57.30     0.05      0.06   0.983
S47                58.26     0.00      0.00      0.00     57.30     0.05      0.06   0.983
S48                58.26     0.00      0.00      0.00     57.30     0.05      0.06   0.983
S6                 58.26     0.00      0.00      0.00     57.30     0.05      0.06   0.983
S7                 58.26     0.00      0.00      0.00     57.31     0.01      0.01   0.984
S8                 58.26     0.00      0.00      0.00     57.31     0.01      0.01   0.984
S9                 58.26     0.00      0.00      0.00     57.31     0.01      0.01   0.984
S10                58.26     0.00      0.00      0.00     57.31     0.01      0.01   0.984
S11                58.26     0.00      0.00      0.00     57.31     0.01      0.01   0.984
*****************
Node Depth Summary
*****************
-------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                         Depth    Depth     HGL    Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J5          JUNCTION     0.06     0.16     1.04     0  00:16
J15         JUNCTION     0.07     0.18     0.88     0  00:16
J19         JUNCTION     0.07     0.18     0.34     0  00:16
J20         JUNCTION     0.07     0.18     0.52     0  00:16
J21         JUNCTION     0.07     0.18     0.70     0  00:16
J27         JUNCTION     0.04     0.11     0.11     0  00:17
J28         JUNCTION     0.05     0.15     0.33     0  00:17
J29         JUNCTION     0.05     0.15     0.51     0  00:17
J30         JUNCTION     0.05     0.15     0.69     0  00:17
J31         JUNCTION     0.05     0.14     0.86     0  00:17
J32         JUNCTION     0.03     0.11     1.01     0  00:17
Out1        OUTFALL      0.00     0.00    -0.97     0  00:00
Out2        OUTFALL      0.00     0.00    -0.79     0  00:00
Out3        OUTFALL      0.00     0.00    -0.61     0  00:00
Out4        OUTFALL      0.00     0.00    -0.43     0  00:00
Out5        OUTFALL      0.00     0.00    -0.25     0  00:00
Out6        OUTFALL      0.00     0.00    -0.07     0  00:00
******************
Node Inflow Summary
******************
-----------------------------------------------------------------------------------------
                        Maximum  Maximum                Lateral     Total
                        Lateral   Total  Time of Max    Inflow     Inflow
                         Inflow   Inflow  Occurrence     Volume     Volume
```

Node	Type	CMS	CMS	days hr:min	10^6 ltr	10^6 ltr
J5	JUNCTION	0.066	0.066	0 00:16	0.060	0.060
J15	JUNCTION	0.066	0.066	0 00:16	0.060	0.060
J19	JUNCTION	0.066	0.066	0 00:16	0.060	0.060
J20	JUNCTION	0.066	0.066	0 00:16	0.060	0.060
J21	JUNCTION	0.066	0.066	0 00:16	0.060	0.060
J27	JUNCTION	0.000	0.041	0 00:17	0.000	0.040
J28	JUNCTION	0.000	0.064	0 00:16	0.000	0.059
J29	JUNCTION	0.000	0.066	0 00:16	0.000	0.060
J30	JUNCTION	0.000	0.064	0 00:16	0.000	0.059
J31	JUNCTION	0.000	0.059	0 00:17	0.000	0.054
J32	JUNCTION	0.000	0.035	0 00:17	0.000	0.030
Out1	OUTFALL	0.000	0.041	0 00:17	0.000	0.040
Out2	OUTFALL	0.000	0.064	0 00:17	0.000	0.059
Out3	OUTFALL	0.000	0.065	0 00:17	0.000	0.060
Out4	OUTFALL	0.000	0.064	0 00:17	0.000	0.059
Out5	OUTFALL	0.000	0.058	0 00:17	0.000	0.053
Out6	OUTFALL	0.000	0.035	0 00:17	0.000	0.030

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out1	93.70	0.012	0.041	0.040
Out2	93.72	0.018	0.064	0.059
Out3	93.72	0.018	0.065	0.060
Out4	93.67	0.017	0.064	0.059
Out5	84.73	0.018	0.058	0.053
Out6	56.46	0.015	0.035	0.030
System	86.00	0.097	0.327	0.301

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C29	CONDUIT	0.041	0 00:17	1.09	0.53	0.42
C30	CONDUIT	0.040	0 00:17	0.90	0.51	0.47
C32	CONDUIT	0.038	0 00:17	0.88	0.49	0.46
C33	CONDUIT	0.031	0 00:17	0.80	0.39	0.42
C39	CONDUIT	0.039	0 00:17	0.89	0.50	0.47
C40	CONDUIT	0.041	0 00:17	1.65	0.31	0.38
C41	CONDUIT	0.065	0 00:17	1.87	0.49	0.49
C42	CONDUIT	0.058	0 00:17	1.82	0.44	0.46
C7	CONDUIT	0.035	0 00:17	1.59	0.26	0.35
C10	CONDUIT	0.064	0 00:17	1.86	0.48	0.49
C12	CONDUIT	0.064	0 00:17	1.86	0.48	0.49
C14	CONDUIT	0.035	0 00:17	1.08	0.45	0.37
C16	CONDUIT	0.027	0 00:15	0.62	0.34	0.47
C17	CONDUIT	0.026	0 00:15	0.61	0.34	0.47
C18	CONDUIT	0.025	0 00:15	0.59	0.32	0.46
C19	CONDUIT	0.028	0 00:16	0.68	0.36	0.45

****
Flow Classification Summary
****

	Adjusted /Actual	--- Fraction of Time in Flow Class ---- Up	Down	Sub	Sup	Up	Down	Avg. Froude	Avg. Flow

Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Number	Change
C29	1.00	0.02	0.00	0.00	0.55	0.43	0.00	0.00	0.82	0.0003
C30	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.75	0.0003
C32	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.74	0.0003
C33	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.70	0.0002
C39	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.75	0.0003
C40	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.61	0.0002
C41	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.61	0.0003
C42	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.62	0.0002
C7	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	1.20	0.0001
C10	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.61	0.0003
C12	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.62	0.0003
C14	1.00	0.02	0.03	0.00	0.70	0.25	0.00	0.00	0.46	0.0003
C16	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.33	0.0002
C17	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.33	0.0002
C18	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.34	0.0002
C19	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.33	0.0002

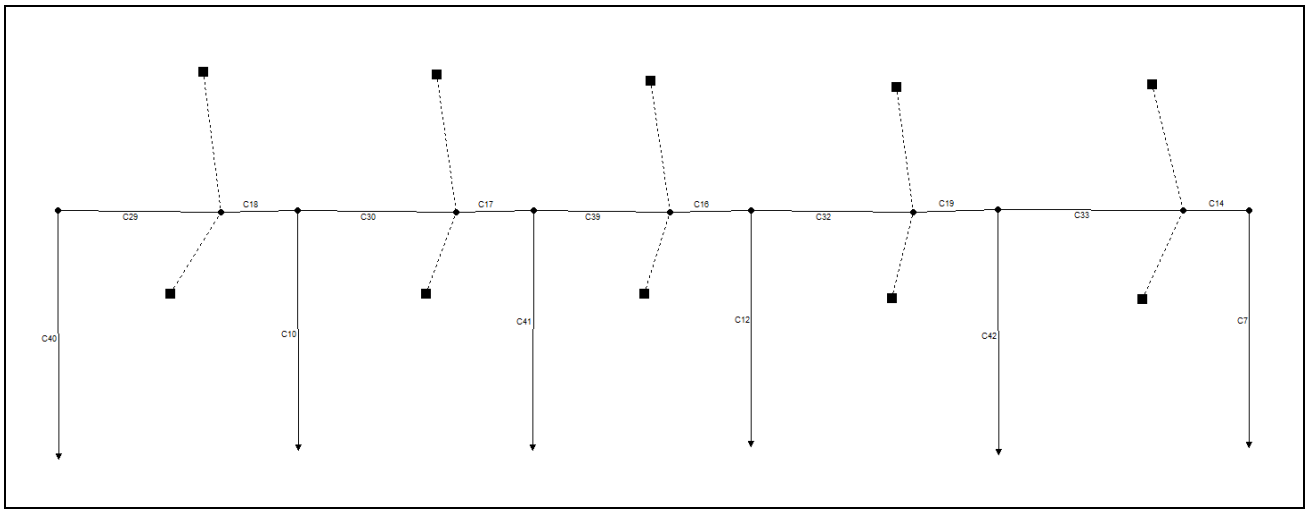
****

Conduit Surcharge Summary

****

No conduits were surcharged.

COLLETTORE Ø350



- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-02-2012 00:00:00
Ending Date .............. FEB-02-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:01
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.024        45.863
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.024        44.906
Final Surface Storage ....         0.001         0.958
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.024         0.236
```

```
  Groundwater Inflow .......        0.000        0.000
  RDII Inflow ..............      0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.024        0.236
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.000
  **************************
  Time-Step Critical Elements
  **************************
  None
  *********************************
  Highest Flow Instability Indexes
  *********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step          :     1.00 sec
  Average Time Step          :     1.00 sec
  Maximum Time Step          :     1.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ***************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                        Total     Total     Total     Total     Total     Total     Peak  Runoff
                        Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
  Subcatchment             mm        mm        mm        mm        mm    10^6 ltr    CMS
  ---------------------------------------------------------------------------------------------------
  S45                    45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S46                    45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S47                    45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S48                    45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S6                     45.86      0.00      0.00      0.00     44.90      0.04     0.09   0.979
  S7                     45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S8                     45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S9                     45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S10                    45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  S11                    45.86      0.00      0.00      0.00     44.91      0.01     0.02   0.979
  ******************
  Node Depth Summary
  ******************
  -------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -------------------------------------------------------------------
  J5            JUNCTION     0.04     0.20     1.08     0  00:08
  J15           JUNCTION     0.05     0.23     0.93     0  00:08
  J19           JUNCTION     0.05     0.23     0.39     0  00:08
  J20           JUNCTION     0.05     0.23     0.58     0  00:08
  J21           JUNCTION     0.05     0.23     0.76     0  00:08
  J27           JUNCTION     0.03     0.14     0.14     0  00:08
  J28           JUNCTION     0.04     0.19     0.37     0  00:08
  J29           JUNCTION     0.04     0.20     0.56     0  00:08
  J30           JUNCTION     0.04     0.20     0.74     0  00:08
  J31           JUNCTION     0.03     0.19     0.91     0  00:08
  J32           JUNCTION     0.02     0.14     1.04     0  00:08
  Out1          OUTFALL      0.00     0.00    -0.97     0  00:00
  Out2          OUTFALL      0.00     0.00    -0.79     0  00:00
  Out3          OUTFALL      0.00     0.00    -0.61     0  00:00
  Out4          OUTFALL      0.00     0.00    -0.43     0  00:00
  Out5          OUTFALL      0.00     0.00    -0.25     0  00:00
  Out6          OUTFALL      0.00     0.00    -0.07     0  00:00
  *******************
  Node Inflow Summary
  *******************
  ------------------------------------------------------------------------------------
                          Maximum  Maximum                  Lateral       Total
```

Node	Type	Lateral Inflow CMS	Total Inflow CMS	Time of Max Occurrence days hr:min	Inflow Volume 10^6 ltr	Inflow Volume 10^6 ltr
J5	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J15	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J19	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J20	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J21	JUNCTION	0.108	0.108	0 00:08	0.047	0.047
J27	JUNCTION	0.000	0.063	0 00:08	0.000	0.030
J28	JUNCTION	0.000	0.102	0 00:08	0.000	0.046
J29	JUNCTION	0.000	0.105	0 00:08	0.000	0.047
J30	JUNCTION	0.000	0.104	0 00:08	0.000	0.046
J31	JUNCTION	0.000	0.096	0 00:08	0.000	0.042
J32	JUNCTION	0.000	0.061	0 00:08	0.000	0.025
Out1	OUTFALL	0.000	0.061	0 00:08	0.000	0.030
Out2	OUTFALL	0.000	0.100	0 00:08	0.000	0.046
Out3	OUTFALL	0.000	0.103	0 00:08	0.000	0.047
Out4	OUTFALL	0.000	0.101	0 00:08	0.000	0.046
Out5	OUTFALL	0.000	0.093	0 00:08	0.000	0.042
Out6	OUTFALL	0.000	0.060	0 00:08	0.000	0.025

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out1	92.00	0.009	0.061	0.030
Out2	76.59	0.017	0.100	0.046
Out3	75.03	0.017	0.103	0.047
Out4	71.34	0.018	0.101	0.046
Out5	62.37	0.019	0.093	0.042
Out6	34.66	0.020	0.060	0.025
System	68.67	0.100	0.518	0.236

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C29	CONDUIT	0.063	0 00:08	1.25	0.81	0.53
C30	CONDUIT	0.059	0 00:08	0.98	0.76	0.61
C32	CONDUIT	0.057	0 00:08	0.95	0.73	0.60
C33	CONDUIT	0.047	0 00:08	0.87	0.60	0.55
C39	CONDUIT	0.059	0 00:08	0.96	0.76	0.61
C40	CONDUIT	0.061	0 00:08	1.84	0.46	0.48
C41	CONDUIT	0.103	0 00:08	2.08	0.77	0.66
C42	CONDUIT	0.093	0 00:08	2.04	0.70	0.62
C7	CONDUIT	0.060	0 00:08	1.84	0.45	0.47
C10	CONDUIT	0.100	0 00:08	2.07	0.75	0.65
C12	CONDUIT	0.101	0 00:08	2.07	0.76	0.65
C14	CONDUIT	0.061	0 00:08	1.32	0.78	0.48
C16	CONDUIT	0.047	0 00:07	0.82	0.61	0.61
C17	CONDUIT	0.047	0 00:07	0.82	0.60	0.61
C18	CONDUIT	0.044	0 00:07	0.83	0.56	0.60
C19	CONDUIT	0.050	0 00:07	0.89	0.64	0.59

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C29	1.00	0.01	0.00	0.00	0.77	0.22	0.00	0.00	0.70	0.0005
C30	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.67	0.0004
C32	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.65	0.0004
C33	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.61	0.0004
C39	1.00	0.01	0.00	0.00	0.96	0.03	0.00	0.00	0.66	0.0004
C40	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.62	0.0003
C41	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.60	0.0004
C42	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.56	0.0004
C7	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.81	0.0003
C10	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.60	0.0004
C12	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	1.59	0.0004
C14	1.00	0.01	0.02	0.00	0.80	0.17	0.00	0.00	0.27	0.0005
C16	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.29	0.0005
C17	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.30	0.0005
C18	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.31	0.0005
C19	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.00	0.27	0.0005

****
Conduit Surcharge Summary
****
No conduits were surcharged.

- Durata 15' – T_R25anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-02-2012 00:00:00
Ending Date FEB-02-2012 01:00:00
Antecedent Dry Days 0.0
Report Time Step 00:00:10
Wet Time Step 00:00:01
Dry Time Step 00:00:10
Routing Time Step ..... 1.00 sec

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
**********	---	---
Total Precipitation	0.018	35.028
Evaporation Loss	0.000	0.000
Infiltration Loss	0.000	0.000
Surface Runoff	0.018	34.070
Final Surface Storage	0.001	0.958
Continuity Error (%)	0.000	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
**********	---	---
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.018	0.179
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000

```
External Outflow .....        0.018        0.179
Internal Outflow .....       0.000        0.000
Storage Losses .....         0.000        0.000
Initial Stored Volume ....     0.000        0.000
Final Stored Volume ......     0.000        0.000
Continuity Error (%) .....     0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :    1.00 sec
Average Time Step          :    1.00 sec
Maximum Time Step          :    1.00 sec
Percent in Steady State    :    0.00
Average Iterations per Step :   2.00
***************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment        mm        mm        mm        mm        mm    10^6 ltr    CMS
-----------------------------------------------------------------------------------------------------
S45               35.03     0.00      0.00      0.00      34.07     0.03      0.07   0.973
S46               35.03     0.00      0.00      0.00      34.07     0.03      0.07   0.973
S47               35.03     0.00      0.00      0.00      34.07     0.03      0.07   0.973
S48               35.03     0.00      0.00      0.00      34.07     0.03      0.07   0.973
S6                35.03     0.00      0.00      0.00      34.07     0.03      0.07   0.973
S7                35.03     0.00      0.00      0.00      34.08     0.01      0.01   0.973
S8                35.03     0.00      0.00      0.00      34.08     0.01      0.01   0.973
S9                35.03     0.00      0.00      0.00      34.08     0.01      0.01   0.973
S10               35.03     0.00      0.00      0.00      34.08     0.01      0.01   0.973
S11               35.03     0.00      0.00      0.00      34.08     0.01      0.01   0.973
******************
Node Depth Summary
******************
-----------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                         Depth    Depth     HGL    Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------------
J5          JUNCTION     0.04     0.17     1.06     0  00:08
J15         JUNCTION     0.04     0.19     0.90     0  00:08
J19         JUNCTION     0.04     0.20     0.36     0  00:08
J20         JUNCTION     0.04     0.20     0.54     0  00:08
J21         JUNCTION     0.04     0.20     0.72     0  00:08
J27         JUNCTION     0.03     0.12     0.12     0  00:08
J28         JUNCTION     0.03     0.16     0.34     0  00:08
J29         JUNCTION     0.03     0.17     0.53     0  00:08
J30         JUNCTION     0.03     0.16     0.70     0  00:08
J31         JUNCTION     0.03     0.16     0.88     0  00:08
J32         JUNCTION     0.02     0.12     1.02     0  00:08
Out1         OUTFALL     0.00     0.00    -0.97     0  00:00
Out2         OUTFALL     0.00     0.00    -0.79     0  00:00
Out3         OUTFALL     0.00     0.00    -0.61     0  00:00
Out4         OUTFALL     0.00     0.00    -0.43     0  00:00
Out5         OUTFALL     0.00     0.00    -0.25     0  00:00
Out6         OUTFALL     0.00     0.00    -0.07     0  00:00
*******************
Node Inflow Summary
*******************
-------------------------------------------------------------------------------------
                        Maximum  Maximum                Lateral     Total
                        Lateral   Total  Time of Max    Inflow     Inflow
                         Inflow   Inflow  Occurrence     Volume     Volume
Node          Type        CMS      CMS  days hr:min    10^6 ltr   10^6 ltr
```

J5	JUNCTION	0.082	0.082	0	00:08	0.036	0.036
J15	JUNCTION	0.082	0.082	0	00:08	0.036	0.036
J19	JUNCTION	0.082	0.082	0	00:08	0.036	0.036
J20	JUNCTION	0.082	0.082	0	00:08	0.036	0.036
J21	JUNCTION	0.082	0.082	0	00:08	0.036	0.036
J27	JUNCTION	0.000	0.049	0	00:08	0.000	0.024
J28	JUNCTION	0.000	0.078	0	00:08	0.000	0.035
J29	JUNCTION	0.000	0.080	0	00:08	0.000	0.036
J30	JUNCTION	0.000	0.079	0	00:08	0.000	0.035
J31	JUNCTION	0.000	0.073	0	00:08	0.000	0.032
J32	JUNCTION	0.000	0.045	0	00:08	0.000	0.018
Out1	OUTFALL	0.000	0.047	0	00:08	0.000	0.023
Out2	OUTFALL	0.000	0.076	0	00:08	0.000	0.035
Out3	OUTFALL	0.000	0.078	0	00:08	0.000	0.036
Out4	OUTFALL	0.000	0.077	0	00:08	0.000	0.035
Out5	OUTFALL	0.000	0.071	0	00:08	0.000	0.032
Out6	OUTFALL	0.000	0.045	0	00:08	0.000	0.018

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out1	91.42	0.007	0.047	0.023
Out2	76.01	0.013	0.076	0.035
Out3	74.48	0.013	0.078	0.036
Out4	70.76	0.014	0.077	0.035
Out5	61.82	0.014	0.071	0.032
Out6	33.94	0.015	0.045	0.018
System	68.07	0.076	0.394	0.179

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C29	CONDUIT	0.049	0 00:08	1.16	0.62	0.45
C30	CONDUIT	0.046	0 00:08	0.93	0.60	0.52
C32	CONDUIT	0.045	0 00:08	0.91	0.57	0.51
C33	CONDUIT	0.037	0 00:08	0.84	0.47	0.47
C39	CONDUIT	0.046	0 00:08	0.92	0.59	0.52
C40	CONDUIT	0.047	0 00:08	1.72	0.35	0.41
C41	CONDUIT	0.078	0 00:08	1.96	0.59	0.55
C42	CONDUIT	0.071	0 00:08	1.91	0.53	0.52
C7	CONDUIT	0.045	0 00:08	1.70	0.34	0.40
C10	CONDUIT	0.076	0 00:08	1.95	0.57	0.54
C12	CONDUIT	0.077	0 00:08	1.95	0.58	0.55
C14	CONDUIT	0.045	0 00:08	1.19	0.58	0.42
C16	CONDUIT	0.035	0 00:08	0.72	0.45	0.52
C17	CONDUIT	0.034	0 00:08	0.71	0.44	0.52
C18	CONDUIT	0.033	0 00:08	0.73	0.42	0.51
C19	CONDUIT	0.036	0 00:08	0.78	0.47	0.50

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Froude Number	Avg. Flow Change

```
-----------------------------------------------------------------------------------------
C29              1.00  0.01  0.00  0.00  0.78  0.21  0.00  0.00    0.70   0.0004
C30              1.00  0.01  0.00  0.00  0.96  0.03  0.00  0.00    0.67   0.0003
C32              1.00  0.01  0.00  0.00  0.96  0.03  0.00  0.00    0.65   0.0003
C33              1.00  0.01  0.00  0.00  0.96  0.03  0.00  0.00    0.61   0.0003
C39              1.00  0.01  0.00  0.00  0.96  0.03  0.00  0.00    0.67   0.0003
C40              1.00  0.02  0.00  0.00  0.00  0.00  0.00  0.98    1.62   0.0002
C41              1.00  0.02  0.00  0.00  0.00  0.00  0.00  0.98    1.60   0.0003
C42              1.00  0.02  0.00  0.00  0.00  0.00  0.00  0.98    1.57   0.0003
C7               1.00  0.04  0.00  0.00  0.00  0.00  0.00  0.96    0.80   0.0002
C10              1.00  0.02  0.00  0.00  0.00  0.00  0.00  0.98    1.60   0.0003
C12              1.00  0.02  0.00  0.00  0.00  0.00  0.00  0.98    1.59   0.0003
C14              1.00  0.01  0.02  0.00  0.81  0.16  0.00  0.00    0.25   0.0004
C16              1.00  0.01  0.01  0.00  0.98  0.00  0.00  0.00    0.28   0.0003
C17              1.00  0.01  0.01  0.00  0.98  0.00  0.00  0.00    0.29   0.0003
C18              1.00  0.01  0.01  0.00  0.98  0.00  0.00  0.00    0.31   0.0003
C19              1.00  0.01  0.01  0.00  0.98  0.00  0.00  0.00    0.26   0.0003
*************************
Conduit Surcharge Summary
*************************
No conduits were surcharged.
```

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-02-2012 00:00:00
Ending Date .............. FEB-02-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:01
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.031        58.264
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.030        57.303
Final Surface Storage ....         0.001         0.962
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.030         0.301
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.030         0.301
Internal Outflow .........         0.000         0.000
Storage Losses ...........         0.000         0.000
```

Initial Stored Volume 0.000 0.000
Final Stored Volume 0.000 0.000
Continuity Error (%) 0.012
****

Time-Step Critical Elements
****

None
****

Highest Flow Instability Indexes
****

All links are stable.
****

Routing Time Step Summary
****

Minimum Time Step : 1.00 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 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 10^6 ltr	Peak Runoff CMS	Runoff Coeff
S45	58.26	0.00	0.00	0.00	57.30	0.05	0.06	0.983
S46	58.26	0.00	0.00	0.00	57.30	0.05	0.06	0.983
S47	58.26	0.00	0.00	0.00	57.30	0.05	0.06	0.983
S48	58.26	0.00	0.00	0.00	57.30	0.05	0.06	0.983
S6	58.26	0.00	0.00	0.00	57.30	0.05	0.06	0.983
S7	58.26	0.00	0.00	0.00	57.31	0.01	0.01	0.984
S8	58.26	0.00	0.00	0.00	57.31	0.01	0.01	0.984
S9	58.26	0.00	0.00	0.00	57.31	0.01	0.01	0.984
S10	58.26	0.00	0.00	0.00	57.31	0.01	0.01	0.984
S11	58.26	0.00	0.00	0.00	57.31	0.01	0.01	0.984

****

Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J5	JUNCTION	0.06	0.16	1.04	0 00:16
J15	JUNCTION	0.07	0.18	0.88	0 00:16
J19	JUNCTION	0.07	0.18	0.34	0 00:16
J20	JUNCTION	0.07	0.18	0.52	0 00:16
J21	JUNCTION	0.07	0.18	0.70	0 00:16
J27	JUNCTION	0.04	0.11	0.11	0 00:17
J28	JUNCTION	0.05	0.15	0.33	0 00:17
J29	JUNCTION	0.05	0.15	0.51	0 00:17
J30	JUNCTION	0.05	0.15	0.69	0 00:17
J31	JUNCTION	0.05	0.14	0.86	0 00:17
J32	JUNCTION	0.03	0.11	1.01	0 00:17
Out1	OUTFALL	0.00	0.00	-0.97	0 00:00
Out2	OUTFALL	0.00	0.00	-0.79	0 00:00
Out3	OUTFALL	0.00	0.00	-0.61	0 00:00
Out4	OUTFALL	0.00	0.00	-0.43	0 00:00
Out5	OUTFALL	0.00	0.00	-0.25	0 00:00
Out6	OUTFALL	0.00	0.00	-0.07	0 00:00

****

Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J5	JUNCTION	0.066	0.066	0 00:16	0.060	0.060
J15	JUNCTION	0.066	0.066	0 00:16	0.060	0.060

J19	JUNCTION	0.066	0.066	0	00:16	0.060	0.060
J20	JUNCTION	0.066	0.066	0	00:16	0.060	0.060
J21	JUNCTION	0.066	0.066	0	00:16	0.060	0.060
J27	JUNCTION	0.000	0.041	0	00:17	0.000	0.040
J28	JUNCTION	0.000	0.064	0	00:16	0.000	0.059
J29	JUNCTION	0.000	0.066	0	00:16	0.000	0.060
J30	JUNCTION	0.000	0.064	0	00:16	0.000	0.059
J31	JUNCTION	0.000	0.059	0	00:17	0.000	0.054
J32	JUNCTION	0.000	0.035	0	00:17	0.000	0.030
Out1	OUTFALL	0.000	0.041	0	00:17	0.000	0.040
Out2	OUTFALL	0.000	0.064	0	00:17	0.000	0.059
Out3	OUTFALL	0.000	0.065	0	00:17	0.000	0.060
Out4	OUTFALL	0.000	0.064	0	00:17	0.000	0.059
Out5	OUTFALL	0.000	0.058	0	00:17	0.000	0.053
Out6	OUTFALL	0.000	0.035	0	00:17	0.000	0.030

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out1	93.70	0.012	0.041	0.040
Out2	93.72	0.018	0.064	0.059
Out3	93.72	0.018	0.065	0.060
Out4	93.67	0.017	0.064	0.059
Out5	84.73	0.018	0.058	0.053
Out6	56.46	0.015	0.035	0.030
System	86.00	0.097	0.327	0.301

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C29	CONDUIT	0.041	0	00:17	1.09	0.53	0.42
C30	CONDUIT	0.040	0	00:17	0.90	0.51	0.47
C32	CONDUIT	0.038	0	00:17	0.88	0.49	0.46
C33	CONDUIT	0.031	0	00:17	0.80	0.39	0.42
C39	CONDUIT	0.039	0	00:17	0.89	0.50	0.47
C40	CONDUIT	0.041	0	00:17	1.65	0.31	0.38
C41	CONDUIT	0.065	0	00:17	1.87	0.49	0.49
C42	CONDUIT	0.058	0	00:17	1.82	0.44	0.46
C7	CONDUIT	0.035	0	00:17	1.59	0.26	0.35
C10	CONDUIT	0.064	0	00:17	1.86	0.48	0.49
C12	CONDUIT	0.064	0	00:17	1.86	0.48	0.49
C14	CONDUIT	0.035	0	00:17	1.08	0.45	0.37
C16	CONDUIT	0.027	0	00:15	0.62	0.34	0.47
C17	CONDUIT	0.026	0	00:15	0.61	0.34	0.47
C18	CONDUIT	0.025	0	00:15	0.59	0.32	0.46
C19	CONDUIT	0.028	0	00:16	0.68	0.36	0.45

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C29	1.00	0.02	0.00	0.00	0.55	0.43	0.00	0.00	0.82	0.0003
C30	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.75	0.0003

C32	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.74	0.0003
C33	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.70	0.0002
C39	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.75	0.0003
C40	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.61	0.0002
C41	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.61	0.0003
C42	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.62	0.0002
C7	1.00	0.06	0.00	0.00	0.00	0.00	0.00	0.94	1.20	0.0001
C10	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.61	0.0003
C12	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	1.62	0.0003
C14	1.00	0.02	0.03	0.00	0.70	0.25	0.00	0.00	0.46	0.0003
C16	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.33	0.0002
C17	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.33	0.0002
C18	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.34	0.0002
C19	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.33	0.0002

****

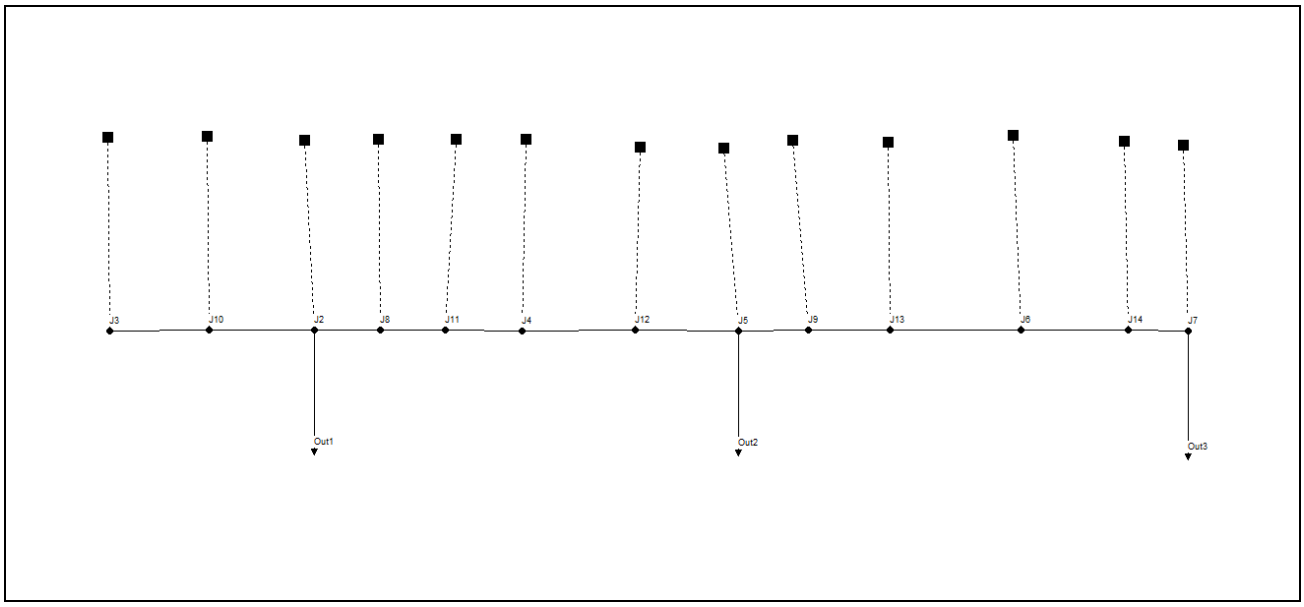
Conduit Surcharge Summary

****

No conduits were surcharged.

ALLEGATO 3: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA IN RETTILINEO

STRADA CAT. B – PENDENZA 0.1% - PASSO EMBRICI 10m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************    ---------       -------
Total Precipitation ......        0.001        35.500
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.001        34.542
Final Surface Storage ....        0.000         0.962
Continuity Error (%) .....        0.000
```

```
**************************        Volume         Volume
Flow Routing Continuity          hectare-m       10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......          0.000          0.000
Wet Weather Inflow .......          0.001          0.011
Groundwater Inflow .......          0.000          0.000
RDII Inflow ..............        0.000          0.000
External Inflow ..........          0.000          0.000
External Outflow .........          0.001          0.011
Internal Outflow .........          0.000          0.000
Storage Losses ...........          0.000          0.000
Initial Stored Volume ....          0.000          0.000
Final Stored Volume ......          0.000          0.000
Continuity Error (%) .....          0.000
***************************
Time-Step Critical Elements
***************************
Link C10 (15.36%)
Link C14 (2.45%)
Link C16 (2.37%)
Link C12 (1.64%)
********************************
Highest Flow Instability Indexes
********************************
Link C16 (9)
Link C14 (9)
Link C12 (7)
Link C6 (1)
Link C2 (1)
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.97 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
****************************
Subcatchment Runoff Summary
****************************
-----------------------------------------------------------------------------------------------------
                    Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip     Runon      Evap      Infil    Runoff    Runoff    Runoff   Coeff
Subcatchment            mm        mm        mm        mm        mm    10^6 ltr      LPS
-----------------------------------------------------------------------------------------------------
S2                   35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S3                   35.50      0.00      0.00      0.00     34.54      0.00     1.05   0.973
S4                   35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S5                   35.50      0.00      0.00      0.00     34.54      0.00     1.05   0.973
S6                   35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S7                   35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S8                   35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S9                   35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S10                  35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S11                  35.50      0.00      0.00      0.00     34.54      0.00     1.75   0.973
S12                  35.50      0.00      0.00      0.00     34.54      0.00     0.70   0.973
S13                  35.50      0.00      0.00      0.00     34.54      0.00     0.70   0.973
S14                  35.50      0.00      0.00      0.00     34.54      0.00     0.70   0.973
******************
Node Depth Summary
******************
-----------------------------------------------------------------------
                         Average  Maximum  Maximum  Time of Max
                           Depth    Depth      HGL   Occurrence
Node            Type        Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------------
J2            JUNCTION       0.00     0.01     0.01    0  00:06
J3            JUNCTION       0.02     0.08     0.08    0  00:06
J4            JUNCTION       0.02     0.07     0.07    0  00:06
J5            JUNCTION       0.00     0.01     0.00    0  00:06
J6            JUNCTION       0.02     0.07     0.06    0  00:06
J7            JUNCTION       0.00     0.01    -0.01    0  00:06
J8            JUNCTION       0.02     0.07     0.07    0  00:06
```

J9	JUNCTION	0.02	0.07	0.06	0	00:06
J10	JUNCTION	0.02	0.08	0.08	0	00:06
J11	JUNCTION	0.02	0.07	0.07	0	00:06
J12	JUNCTION	0.02	0.08	0.07	0	00:06
J13	JUNCTION	0.02	0.07	0.06	0	00:06
J14	JUNCTION	0.02	0.08	0.06	0	00:06
Out1	OUTFALL	0.00	0.01	-3.99	0	00:06
Out2	OUTFALL	0.00	0.01	-4.00	0	00:06
Out3	OUTFALL	0.00	0.01	-4.01	0	00:06

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	0.70	7.11	0 00:06	0.000	0.004
J3	JUNCTION	1.75	1.75	0 00:06	0.001	0.001
J4	JUNCTION	1.75	1.75	0 00:06	0.001	0.001
J5	JUNCTION	0.70	6.96	0 00:06	0.000	0.004
J6	JUNCTION	1.75	1.75	0 00:06	0.001	0.001
J7	JUNCTION	0.70	4.05	0 00:06	0.000	0.002
J8	JUNCTION	1.05	2.92	0 00:06	0.001	0.002
J9	JUNCTION	1.05	2.92	0 00:06	0.001	0.002
J10	JUNCTION	1.75	3.50	0 00:06	0.001	0.002
J11	JUNCTION	1.75	2.07	0 00:03	0.001	0.001
J12	JUNCTION	1.75	3.36	0 00:06	0.001	0.002
J13	JUNCTION	1.75	2.07	0 00:03	0.001	0.001
J14	JUNCTION	1.75	3.36	0 00:06	0.001	0.002
Out1	OUTFALL	0.00	7.11	0 00:06	0.000	0.004
Out2	OUTFALL	0.00	6.96	0 00:06	0.000	0.004
Out3	OUTFALL	0.00	4.05	0 00:06	0.000	0.002

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	48.32	2.49	7.11	0.004
Out2	56.83	2.06	6.96	0.004
Out3	56.08	1.19	4.05	0.002
System	53.74	5.75	18.12	0.011

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	7.11	0 00:06	2.08	0.03	0.11
C3	CHANNEL	1.75	0 00:06	0.20	0.13	0.76
C4	CHANNEL	1.87	0 00:06	0.26	0.14	0.69
C5	CHANNEL	1.61	0 00:06	0.20	0.12	0.76
C6	CONDUIT	6.96	0 00:06	2.07	0.03	0.11
C7	CHANNEL	1.87	0 00:06	0.26	0.14	0.69
C8	CHANNEL	1.61	0 00:06	0.20	0.12	0.76
C9	CONDUIT	4.05	0 00:06	1.68	0.02	0.08
C10	CHANNEL	2.91	0 00:06	1.07	0.22	0.39
C11	CHANNEL	2.91	0 00:06	1.07	0.22	0.39

C12	CHANNEL	3.50	0	00:06	1.19	0.27	0.45
C13	CHANNEL	0.37	0	00:17	0.10	0.03	0.73
C14	CHANNEL	3.35	0	00:06	1.23	0.25	0.44
C15	CHANNEL	0.38	0	00:17	0.10	0.03	0.73
C16	CHANNEL	3.35	0	00:06	1.23	0.25	0.43

****

Flow Classification Summary

****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.12	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.20	0.0001
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.22	0.0001
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.28	0.0001
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.29	0.0000
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.22	0.0001
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.28	0.0001
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.19	0.0000
C10	1.00	0.02	0.00	0.00	0.67	0.32	0.00	0.00	0.64	0.0001
C11	1.00	0.02	0.00	0.00	0.67	0.31	0.00	0.00	0.64	0.0001
C12	1.00	0.02	0.00	0.00	0.46	0.52	0.00	0.00	0.97	0.0027
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.16	0.0000
C14	1.00	0.02	0.00	0.00	0.25	0.73	0.00	0.00	1.16	0.0031
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.16	0.0000
C16	1.00	0.02	0.00	0.00	0.25	0.74	0.00	0.00	1.20	0.0033

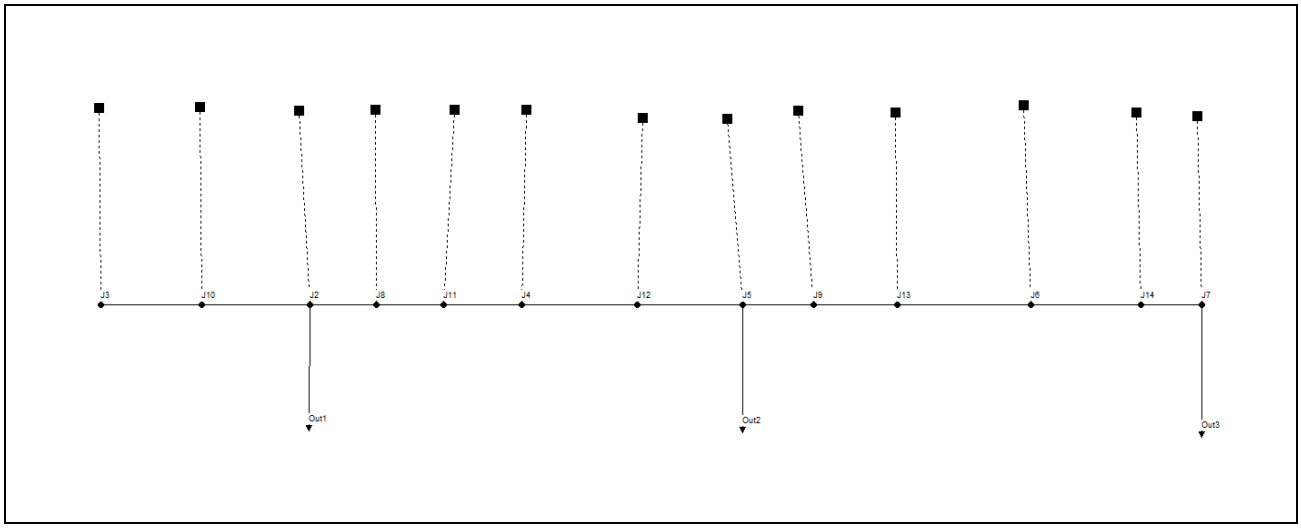
****

Conduit Surcharge Summary

****

No conduits were surcharged.

STRADA CAT. B – PENDENZA 0.8% - PASSO EMBRICI 15m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.002        35.500
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.002        34.542
Final Surface Storage ....        0.000         0.962
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.002         0.016
Groundwater Inflow .......        0.000         0.000
```

```
RDII Inflow ..............      0.000      0.000
External Inflow ..........      0.000      0.000
External Outflow .........      0.002      0.016
Internal Outflow .........      0.000      0.000
Storage Losses ...........      0.000      0.000
Initial Stored Volume ....      0.000      0.000
Final Stored Volume ......      0.000      0.000
Continuity Error (%) .....      0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
*************************
Minimum Time Step          :     0.77 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
**************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment         mm        mm        mm        mm        mm    10^6 ltr    LPS
-----------------------------------------------------------------------------------------------
S2                35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S3                35.50      0.00      0.00      0.00     34.54      0.00     1.57   0.973
S4                35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S5                35.50      0.00      0.00      0.00     34.54      0.00     1.57   0.973
S6                35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S7                35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S8                35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S9                35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S10               35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S11               35.50      0.00      0.00      0.00     34.54      0.00     2.62   0.973
S12               35.50      0.00      0.00      0.00     34.54      0.00     1.05   0.973
S13               35.50      0.00      0.00      0.00     34.54      0.00     1.05   0.973
S14               35.50      0.00      0.00      0.00     34.54      0.00     1.05   0.973
******************
Node Depth Summary
******************
-------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
Node          Type        Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J2          JUNCTION       0.00     0.01     0.01    0  00:06
J3          JUNCTION       0.01     0.06     0.10    0  00:06
J4          JUNCTION       0.02     0.07    -0.01    0  00:06
J5          JUNCTION       0.00     0.02    -0.10    0  00:06
J6          JUNCTION       0.02     0.07    -0.13    0  00:06
J7          JUNCTION       0.00     0.02    -0.22    0  00:06
J8          JUNCTION       0.01     0.04     0.02    0  00:06
J9          JUNCTION       0.01     0.04    -0.10    0  00:06
J10         JUNCTION       0.02     0.07     0.08    0  00:06
J11         JUNCTION       0.02     0.07     0.02    0  00:06
J12         JUNCTION       0.02     0.08    -0.03    0  00:06
J13         JUNCTION       0.02     0.07    -0.10    0  00:06
J14         JUNCTION       0.02     0.08    -0.15    0  00:06
Out1        OUTFALL        0.00     0.01    -3.99    0  00:06
Out2        OUTFALL        0.00     0.01    -3.99    0  00:06
Out3        OUTFALL        0.00     0.01    -3.99    0  00:06
*******************
Node Inflow Summary
*******************
-----------------------------------------------------------------------------------------
```

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	1.05	6.59	0 00:06	0.001	0.004
J3	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J4	JUNCTION	2.62	6.54	0 00:06	0.002	0.004
J5	JUNCTION	1.05	10.47	0 00:06	0.001	0.006
J6	JUNCTION	2.62	6.56	0 00:06	0.002	0.004
J7	JUNCTION	1.05	10.24	0 00:06	0.001	0.006
J8	JUNCTION	1.57	1.57	0 00:06	0.001	0.001
J9	JUNCTION	1.57	1.57	0 00:06	0.001	0.001
J10	JUNCTION	2.62	5.25	0 00:06	0.002	0.003
J11	JUNCTION	2.62	3.91	0 00:06	0.002	0.002
J12	JUNCTION	2.62	9.16	0 00:06	0.002	0.005
J13	JUNCTION	2.62	3.94	0 00:06	0.002	0.002
J14	JUNCTION	2.62	9.19	0 00:06	0.002	0.006
Out1	OUTFALL	0.00	6.59	0 00:06	0.000	0.004
Out2	OUTFALL	0.00	10.47	0 00:06	0.000	0.006
Out3	OUTFALL	0.00	10.24	0 00:06	0.000	0.006

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	43.51	2.44	6.59	0.004
Out2	52.00	3.29	10.47	0.006
Out3	52.94	3.23	10.24	0.006
System	49.48	8.95	27.30	0.016

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	6.59	0 00:06	2.02	0.03	0.11
C3	CHANNEL	2.62	0 00:06	0.42	0.07	0.65
C4	CHANNEL	1.29	0 00:06	0.32	0.03	0.52
C5	CHANNEL	6.54	0 00:06	0.48	0.18	0.74
C6	CONDUIT	10.47	0 00:06	2.39	0.05	0.15
C7	CHANNEL	1.32	0 00:06	0.33	0.04	0.52
C8	CHANNEL	6.56	0 00:06	0.48	0.18	0.74
C9	CONDUIT	10.24	0 00:06	2.34	0.05	0.15
C10	CHANNEL	0.29	0 00:06	0.19	0.01	0.25
C11	CHANNEL	0.26	0 00:06	0.15	0.01	0.27
C12	CHANNEL	5.25	0 00:06	1.86	0.14	0.40
C13	CHANNEL	3.91	0 00:06	0.45	0.11	0.69
C14	CHANNEL	9.16	0 00:06	2.75	0.25	0.46
C15	CHANNEL	3.94	0 00:06	0.45	0.11	0.69
C16	CHANNEL	9.19	0 00:06	2.76	0.25	0.46

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Froude Number	Avg. Flow Change

C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.00	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.46	0.0000
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.43	0.0000
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.65	0.0001
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.18	0.0000
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.45	0.0000
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.65	0.0001
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.13	0.0000
C10	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.16	0.0000
C11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.21	0.0000
C12	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	1.77	0.0001
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.61	0.0001
C14	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	2.12	0.0002
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.62	0.0001
C16	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	2.12	0.0002

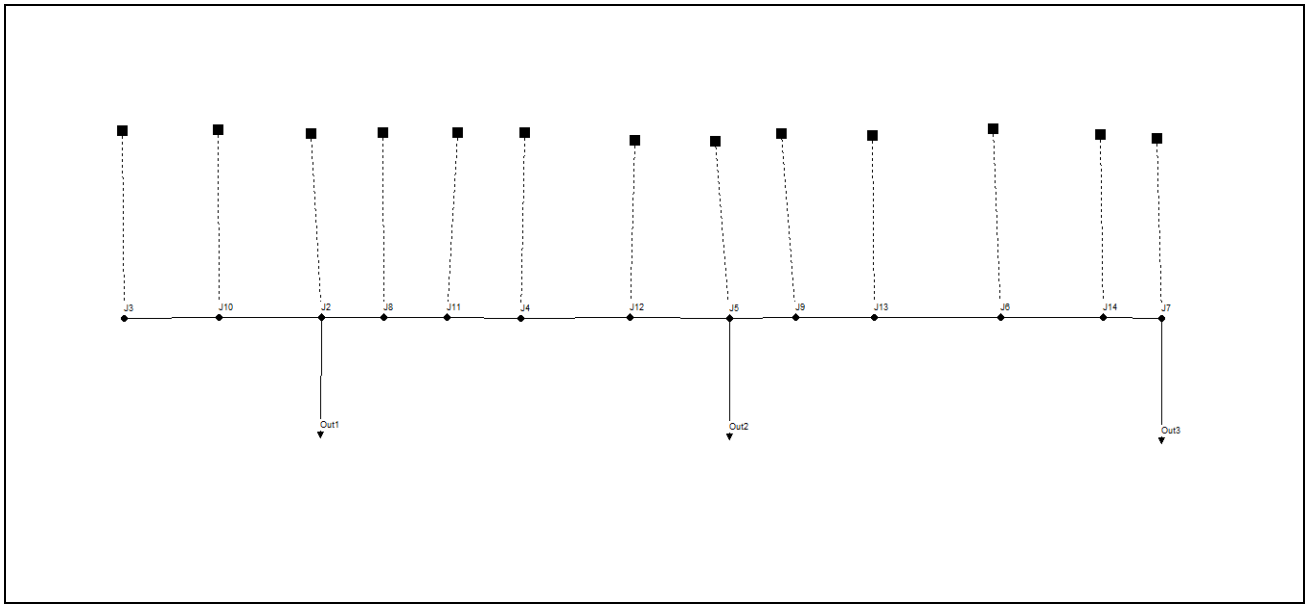
****

Conduit Surcharge Summary

****

No conduits were surcharged.

STRADA CAT. C1 – PENDENZA 0.2% - PASSO EMBRICI 20m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.001        35.500
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.001        34.549
Final Surface Storage ....        0.000         0.957
Continuity Error (%) .....        0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------      ---------
```

```
  Dry Weather Inflow .....        0.000        0.000
  Wet Weather Inflow .....        0.001        0.013
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow .............       0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.001        0.013
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.000
  *************************
  Highest Continuity Errors
  *************************
  Node J10 (1.24%)
  ***************************
  Time-Step Critical Elements
  ***************************
  None
  *******************************
  Highest Flow Instability Indexes
  *******************************
  Link C12 (30)
  Link C16 (21)
  Link C14 (21)
  Link C9 (10)
  Link C6 (9)
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step          :     0.99 sec
  Average Time Step          :     1.00 sec
  Maximum Time Step          :     1.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ****************************
  Subcatchment Runoff Summary
  ****************************
  ---------------------------------------------------------------------------------------------------
                        Total     Total     Total     Total     Total     Total     Peak  Runoff
                        Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
  Subcatchment            mm        mm        mm        mm        mm    10^6 ltr    LPS
  ---------------------------------------------------------------------------------------------------
  S2                    35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S3                    35.50      0.00      0.00      0.00     34.55      0.00     1.23   0.973
  S4                    35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S5                    35.50      0.00      0.00      0.00     34.55      0.00     1.23   0.973
  S6                    35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S7                    35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S8                    35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S9                    35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S10                   35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S11                   35.50      0.00      0.00      0.00     34.55      0.00     2.04   0.973
  S12                   35.50      0.00      0.00      0.00     34.55      0.00     0.82   0.973
  S13                   35.50      0.00      0.00      0.00     34.55      0.00     0.82   0.973
  S14                   35.50      0.00      0.00      0.00     34.55      0.00     0.82   0.973
  ******************
  Node Depth Summary
  ******************
  -------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -------------------------------------------------------------------
  J2          JUNCTION      0.00     0.01     0.01     0  00:05
  J3          JUNCTION      0.02     0.07     0.08     0  00:05
  J4          JUNCTION      0.02     0.07     0.05     0  00:06
  J5          JUNCTION      0.00     0.01    -0.03     0  00:06
  J6          JUNCTION      0.02     0.07     0.01     0  00:06
  J7          JUNCTION      0.00     0.01    -0.07     0  00:06
  J8          JUNCTION      0.01     0.06     0.05     0  00:06
  J9          JUNCTION      0.01     0.06     0.01     0  00:06
  J10          JUNCTION     0.02     0.07     0.07     0  00:03
```

J11	JUNCTION	0.02	0.07	0.05	0	00:06
J12	JUNCTION	0.02	0.07	0.04	0	00:06
J13	JUNCTION	0.02	0.07	0.01	0	00:06
J14	JUNCTION	0.02	0.07	-0.00	0	00:06
Out1	OUTFALL	0.00	0.01	-3.99	0	00:05
Out2	OUTFALL	0.00	0.01	-3.99	0	00:06
Out3	OUTFALL	0.00	0.01	-3.99	0	00:06

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	0.82	6.37	0	00:05	0.000	0.004
J3	JUNCTION	2.04	2.04	0	00:06	0.001	0.001
J4	JUNCTION	2.04	3.90	0	00:06	0.001	0.002
J5	JUNCTION	0.82	8.16	0	00:06	0.000	0.005
J6	JUNCTION	2.04	3.87	0	00:06	0.001	0.002
J7	JUNCTION	0.82	6.72	0	00:06	0.000	0.004
J8	JUNCTION	1.23	1.54	0	00:02	0.001	0.001
J9	JUNCTION	1.23	1.54	0	00:02	0.001	0.001
J10	JUNCTION	2.04	4.08	0	00:05	0.001	0.002
J11	JUNCTION	2.04	2.04	0	00:06	0.001	0.001
J12	JUNCTION	2.04	5.93	0	00:06	0.001	0.003
J13	JUNCTION	2.04	2.04	0	00:06	0.001	0.001
J14	JUNCTION	2.04	5.91	0	00:06	0.001	0.003
Out1	OUTFALL	0.00	6.35	0	00:05	0.000	0.004
Out2	OUTFALL	0.00	8.16	0	00:06	0.000	0.005
Out3	OUTFALL	0.00	6.72	0	00:06	0.000	0.004

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	42.63	2.47	6.35	0.004
Out2	55.12	2.43	8.16	0.005
Out3	55.57	1.95	6.72	0.004
System	51.11	6.85	21.21	0.013

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	6.35	0	00:05	2.00	0.03	0.11
C3	CHANNEL	2.04	0	00:05	0.27	0.11	0.66
C4	CHANNEL	0.35	0	00:02	0.10	0.02	0.62
C5	CHANNEL	3.89	0	00:06	0.29	0.21	0.73
C6	CONDUIT	8.16	0	00:06	2.19	0.04	0.12
C7	CHANNEL	0.35	0	00:02	0.10	0.02	0.62
C8	CHANNEL	3.87	0	00:06	0.30	0.21	0.73
C9	CONDUIT	6.72	0	00:06	2.02	0.03	0.11
C10	CHANNEL	1.40	0	00:06	0.62	0.08	0.34
C11	CHANNEL	1.42	0	00:06	0.60	0.08	0.35
C12	CHANNEL	4.16	0	00:03	1.55	0.22	0.39
C13	CHANNEL	1.85	0	00:06	0.21	0.10	0.71

C14	CHANNEL	5.92	0	00:06	1.94	0.32	0.43
C15	CHANNEL	1.83	0	00:06	0.21	0.10	0.70
C16	CHANNEL	5.90	0	00:06	1.98	0.32	0.42

****

Flow Classification Summary
****

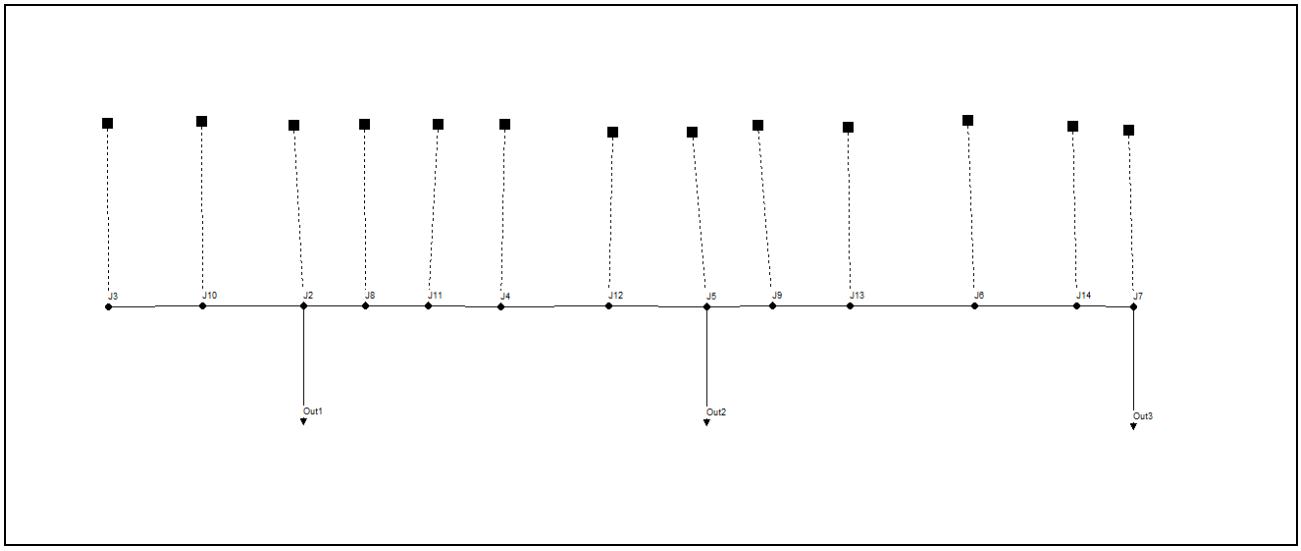
Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	3.97	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.25	0.0001
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.17	0.0000
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.38	0.0001
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.23	0.0001
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.18	0.0000
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.38	0.0001
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.18	0.0001
C10	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.00	0.33	0.0000
C11	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.00	0.35	0.0000
C12	1.00	0.02	0.00	0.00	0.48	0.50	0.00	0.00	1.07	0.0115
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.28	0.0001
C14	1.00	0.02	0.00	0.00	0.30	0.68	0.00	0.00	1.39	0.0110
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.28	0.0001
C16	1.00	0.02	0.00	0.00	0.29	0.69	0.00	0.00	1.41	0.0110

****

Conduit Surcharge Summary
****

No conduits were surcharged.

RAMPA – PENDENZA 0.5% - PASSO EMBRICI 30m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.001        35.500
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.001        34.555
Final Surface Storage ....         0.000         0.954
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.001         0.009
Groundwater Inflow .......         0.000         0.000
```

```
RDII Inflow ..............      0.000      0.000
External Inflow ..........      0.000      0.000
External Outflow .........      0.001      0.009
Internal Outflow .........      0.000      0.000
Storage Losses ...........      0.000      0.000
Initial Stored Volume ....      0.000      0.000
Final Stored Volume ......      0.000      0.000
Continuity Error (%) .....      0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
*************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
**************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment         mm        mm        mm        mm        mm    10^6 ltr    LPS
-----------------------------------------------------------------------------------------------------
S2                35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S3                35.50      0.00      0.00      0.00     34.55      0.00      0.92   0.973
S4                35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S5                35.50      0.00      0.00      0.00     34.55      0.00      0.92   0.973
S6                35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S7                35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S8                35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S9                35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S10               35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S11               35.50      0.00      0.00      0.00     34.55      0.00      1.53   0.973
S12               35.50      0.00      0.00      0.00     34.55      0.00      0.61   0.973
S13               35.50      0.00      0.00      0.00     34.55      0.00      0.61   0.973
S14               35.50      0.00      0.00      0.00     34.55      0.00      0.61   0.973
******************
Node Depth Summary
******************
-------------------------------------------------------------------
                       Average  Maximum  Maximum  Time of Max
                         Depth    Depth      HGL   Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J2          JUNCTION      0.00     0.01     0.01    0  00:06
J3          JUNCTION      0.00     0.02     0.07    0  00:06
J4          JUNCTION      0.01     0.03    -0.07    0  00:06
J5          JUNCTION      0.00     0.01    -0.14    0  00:06
J6          JUNCTION      0.01     0.03    -0.22    0  00:06
J7          JUNCTION      0.00     0.01    -0.29    0  00:06
J8          JUNCTION      0.00     0.02    -0.01    0  00:06
J9          JUNCTION      0.00     0.02    -0.16    0  00:06
J10         JUNCTION      0.01     0.02     0.04    0  00:06
J11         JUNCTION      0.01     0.02    -0.04    0  00:06
J12         JUNCTION      0.01     0.03    -0.11    0  00:06
J13         JUNCTION      0.01     0.02    -0.19    0  00:06
J14         JUNCTION      0.01     0.03    -0.26    0  00:06
Out1        OUTFALL       0.00     0.01    -3.99    0  00:06
Out2        OUTFALL       0.00     0.01    -4.14    0  00:06
Out3        OUTFALL       0.00     0.01    -4.29    0  00:06
*******************
Node Inflow Summary
*******************
-----------------------------------------------------------------------------------------
```

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	0.61	3.68	0	00:06	0.000	0.002
J3	JUNCTION	1.53	1.53	0	00:06	0.001	0.001
J4	JUNCTION	1.53	4.14	0	00:06	0.001	0.002
J5	JUNCTION	0.61	6.28	0	00:06	0.000	0.004
J6	JUNCTION	1.53	4.36	0	00:06	0.001	0.003
J7	JUNCTION	0.61	6.48	0	00:06	0.000	0.004
J8	JUNCTION	0.92	1.08	0	00:06	0.001	0.001
J9	JUNCTION	0.92	1.30	0	00:06	0.001	0.001
J10	JUNCTION	1.53	3.06	0	00:06	0.001	0.002
J11	JUNCTION	1.53	2.62	0	00:06	0.001	0.002
J12	JUNCTION	1.53	5.67	0	00:06	0.001	0.003
J13	JUNCTION	1.53	2.83	0	00:06	0.001	0.002
J14	JUNCTION	1.53	5.87	0	00:06	0.001	0.003
Out1	OUTFALL	0.00	3.51	0	00:06	0.000	0.002
Out2	OUTFALL	0.00	5.89	0	00:06	0.000	0.004
Out3	OUTFALL	0.00	6.47	0	00:06	0.000	0.004

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	36.66	1.58	3.51	0.002
Out2	45.68	2.13	5.89	0.004
Out3	46.18	2.27	6.47	0.004
System	42.84	5.99	15.88	0.009

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	3.51	0	00:06	1.59	0.04	0.15
C3	CHANNEL	1.53	0	00:06	0.18	0.06	0.42
C4	CHANNEL	1.08	0	00:06	0.15	0.05	0.38
C5	CHANNEL	4.14	0	00:06	0.27	0.17	0.55
C6	CONDUIT	5.89	0	00:06	1.94	0.07	0.20
C7	CHANNEL	1.30	0	00:06	0.17	0.05	0.39
C8	CHANNEL	4.34	0	00:06	0.28	0.18	0.56
C9	CONDUIT	6.47	0	00:06	2.01	0.08	0.21
C10	CHANNEL	0.17	0	00:06	0.06	0.01	0.23
C11	CHANNEL	0.39	0	00:06	0.10	0.02	0.27
C12	CHANNEL	3.06	0	00:06	0.62	0.13	0.31
C13	CHANNEL	2.61	0	00:06	0.23	0.11	0.48
C14	CHANNEL	5.67	0	00:06	0.72	0.24	0.40
C15	CHANNEL	2.83	0	00:06	0.24	0.12	0.49
C16	CHANNEL	5.87	0	00:06	0.71	0.25	0.41

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Froude Number	Avg. Flow Change

C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	3.75	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.30	0.0000
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.35	0.0000
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.44	0.0001
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.06	0.0000
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.36	0.0000
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.44	0.0001
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.08	0.0000
C10	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.06	0.0000
C11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.11	0.0000
C12	1.00	0.02	0.00	0.00	0.02	0.96	0.00	0.00	1.75	0.0001
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.46	0.0001
C14	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	1.84	0.0001
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.47	0.0001
C16	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	1.83	0.0001

****

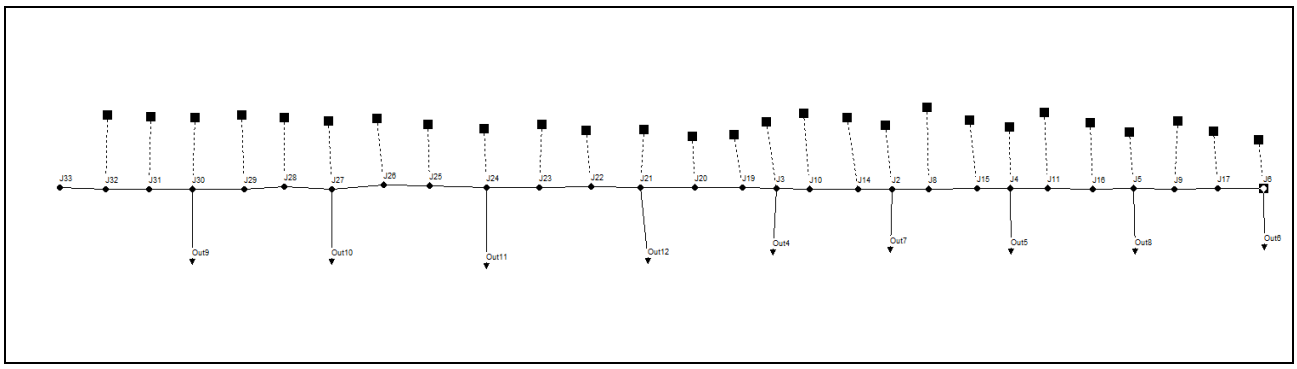
Conduit Surcharge Summary

****

No conduits were surcharged.

TRATTO COMPRESO TRA IL SOTTOVIA K.MARX E IL TORRENTE MODOLENA

STRADA CAT. C1 - PASSO SCARICHI 15m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 05:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.004        35.500
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.004        34.552
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....        0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.004         0.036
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.004         0.036
Internal Outflow .........        0.000         0.000
```

Storage Losses 0.000 0.000
Initial Stored Volume 0.000 0.000
Final Stored Volume 0.000 0.000
Continuity Error (%) 0.000
****

Time-Step Critical Elements
****

Link C42 (1.99%)
****

Highest Flow Instability Indexes
****

All links are stable.
****

Routing Time Step Summary
****

Minimum Time Step : 0.50 sec
Average Time Step : 0.99 sec
Maximum Time Step : 1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S2	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S3	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S4	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S5	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S8	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S9	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S10	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S11	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S13	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S14	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S16	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S17	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S19	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S20	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S21	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973
S22	35.50	0.00	0.00	0.00	34.55	0.00	2.33	0.973
S23	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S24	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S25	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S26	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S27	35.50	0.00	0.00	0.00	34.54	0.00	2.57	0.973
S28	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S29	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S30	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S31	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S32	35.50	0.00	0.00	0.00	34.55	0.00	2.33	0.973
S33	35.50	0.00	0.00	0.00	34.55	0.00	2.04	0.973

****

Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J2	JUNCTION	0.00	0.02	0.20	0 00:06
J3	JUNCTION	0.00	0.02	0.26	0 00:06
J4	JUNCTION	0.00	0.02	0.14	0 00:06
J5	JUNCTION	0.00	0.02	0.08	0 00:06
J6	JUNCTION	0.00	0.02	0.02	0 00:06
J8	JUNCTION	0.00	0.06	0.22	0 00:06
J9	JUNCTION	0.00	0.06	0.10	0 00:06
J10	JUNCTION	0.00	0.06	0.28	0 00:06
J11	JUNCTION	0.00	0.06	0.16	0 00:06
J14	JUNCTION	0.01	0.07	0.27	0 00:06

J15	JUNCTION	0.01	0.07	0.21	0	00:06
J16	JUNCTION	0.01	0.07	0.15	0	00:06
J17	JUNCTION	0.01	0.07	0.09	0	00:06
J19	JUNCTION	0.01	0.07	0.33	0	00:06
J20	JUNCTION	0.00	0.06	0.34	0	00:06
J21	JUNCTION	0.00	0.02	0.32	0	00:06
J22	JUNCTION	0.01	0.07	0.39	0	00:06
J23	JUNCTION	0.00	0.06	0.40	0	00:06
J24	JUNCTION	0.00	0.02	0.38	0	00:06
J25	JUNCTION	0.01	0.07	0.45	0	00:06
J26	JUNCTION	0.00	0.06	0.46	0	00:06
J27	JUNCTION	0.00	0.02	0.44	0	00:06
J28	JUNCTION	0.01	0.07	0.51	0	00:06
J29	JUNCTION	0.00	0.06	0.52	0	00:06
J30	JUNCTION	0.00	0.02	0.50	0	00:06
J31	JUNCTION	0.00	0.07	0.57	0	00:06
J32	JUNCTION	0.00	0.06	0.58	0	00:06
J33	JUNCTION	0.00	0.04	0.58	0	00:05
Out4	OUTFALL	0.00	0.02	-1.98	0	00:06
Out5	OUTFALL	0.00	0.02	-1.98	0	00:06
Out6	OUTFALL	0.00	0.02	-1.98	0	00:06
Out7	OUTFALL	0.00	0.02	-1.98	0	00:06
Out8	OUTFALL	0.00	0.02	-1.98	0	00:06
Out9	OUTFALL	0.00	0.02	-1.98	0	00:06
Out10	OUTFALL	0.00	0.02	-1.98	0	00:06
Out11	OUTFALL	0.00	0.02	-1.98	0	00:06
Out12	OUTFALL	0.00	0.02	-1.98	0	00:06

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	2.04	6.12	0	00:06	0.001	0.004
J3	JUNCTION	2.04	6.93	0	00:06	0.001	0.004
J4	JUNCTION	2.04	6.12	0	00:06	0.001	0.004
J5	JUNCTION	2.04	6.12	0	00:06	0.001	0.004
J6	JUNCTION	2.04	5.51	0	00:06	0.001	0.003
J8	JUNCTION	2.04	2.04	0	00:06	0.001	0.001
J9	JUNCTION	2.04	2.04	0	00:06	0.001	0.001
J10	JUNCTION	2.04	2.04	0	00:06	0.001	0.001
J11	JUNCTION	2.04	2.04	0	00:06	0.001	0.001
J14	JUNCTION	2.04	3.47	0	00:06	0.001	0.002
J15	JUNCTION	2.04	3.47	0	00:06	0.001	0.002
J16	JUNCTION	2.04	3.47	0	00:06	0.001	0.002
J17	JUNCTION	2.04	3.47	0	00:06	0.001	0.002
J19	JUNCTION	2.33	4.28	0	00:06	0.001	0.003
J20	JUNCTION	2.62	2.62	0	00:06	0.002	0.002
J21	JUNCTION	2.62	7.87	0	00:06	0.002	0.005
J22	JUNCTION	2.62	4.57	0	00:06	0.002	0.003
J23	JUNCTION	2.62	2.62	0	00:06	0.002	0.002
J24	JUNCTION	2.57	7.82	0	00:06	0.002	0.005
J25	JUNCTION	2.62	4.57	0	00:06	0.002	0.003
J26	JUNCTION	2.62	2.62	0	00:06	0.002	0.002
J27	JUNCTION	2.62	7.61	0	00:06	0.002	0.005
J28	JUNCTION	2.62	4.30	0	00:06	0.002	0.003
J29	JUNCTION	2.33	2.33	0	00:06	0.001	0.001
J30	JUNCTION	2.04	6.71	0	00:06	0.001	0.004
J31	JUNCTION	2.04	4.05	0	00:06	0.001	0.002
J32	JUNCTION	2.04	2.06	0	00:06	0.001	0.001
J33	JUNCTION	0.00	0.56	0	00:03	0.000	0.000
Out4	OUTFALL	0.00	6.93	0	00:06	0.000	0.004
Out5	OUTFALL	0.00	6.12	0	00:06	0.000	0.004
Out6	OUTFALL	0.00	5.51	0	00:06	0.000	0.003
Out7	OUTFALL	0.00	6.12	0	00:06	0.000	0.004
Out8	OUTFALL	0.00	6.12	0	00:06	0.000	0.004
Out9	OUTFALL	0.00	6.71	0	00:06	0.000	0.004
Out10	OUTFALL	0.00	7.61	0	00:06	0.000	0.005
Out11	OUTFALL	0.00	7.82	0	00:06	0.000	0.005
Out12	OUTFALL	0.00	7.87	0	00:06	0.000	0.005

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out4	10.39	2.88	6.93	0.004
Out5	10.02	2.69	6.12	0.004
Out6	10.41	2.37	5.51	0.003
Out7	10.09	2.67	6.12	0.004
Out8	10.01	2.69	6.12	0.004
Out9	10.04	2.92	6.71	0.004
Out10	10.35	3.25	7.61	0.005
Out11	11.46	2.99	7.82	0.005
Out12	10.70	3.23	7.87	0.005
System	10.39	25.70	60.81	0.036

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C3	CHANNEL	1.43	0 00:06	0.32	0.05	0.63
C4	CHANNEL	1.43	0 00:06	0.32	0.05	0.63
C5	CHANNEL	1.43	0 00:06	0.32	0.05	0.63
C7	CHANNEL	1.43	0 00:06	0.32	0.05	0.63
C10	CHANNEL	0.61	0 00:06	0.23	0.02	0.39
C11	CHANNEL	0.61	0 00:06	0.23	0.02	0.39
C12	CHANNEL	0.61	0 00:06	0.22	0.02	0.39
C13	CHANNEL	0.61	0 00:06	0.23	0.02	0.39
C15	CONDUIT	6.93	0 00:06	4.74	0.06	0.16
C16	CONDUIT	6.12	0 00:06	4.48	0.05	0.15
C17	CONDUIT	5.51	0 00:06	4.26	0.05	0.15
C19	CHANNEL	3.47	0 00:06	1.07	0.13	0.45
C20	CHANNEL	3.47	0 00:06	1.07	0.13	0.45
C21	CHANNEL	3.47	0 00:06	1.07	0.13	0.45
C22	CHANNEL	3.47	0 00:06	1.08	0.13	0.44
C23	CONDUIT	6.12	0 00:06	4.53	0.05	0.15
C24	CONDUIT	6.12	0 00:06	4.44	0.05	0.16
C26	CHANNEL	4.30	0 00:06	1.23	0.16	0.47
C27	CHANNEL	0.68	0 00:06	0.23	0.03	0.42
C28	CHANNEL	1.94	0 00:06	0.33	0.07	0.67
C29	CHANNEL	4.57	0 00:06	1.28	0.17	0.48
C30	CHANNEL	0.68	0 00:05	0.23	0.03	0.42
C31	CHANNEL	1.94	0 00:06	0.31	0.07	0.67
C32	CHANNEL	4.57	0 00:06	1.28	0.17	0.48
C33	CHANNEL	0.68	0 00:06	0.23	0.03	0.42
C34	CHANNEL	1.94	0 00:06	0.34	0.07	0.67
C35	CHANNEL	4.27	0 00:06	1.24	0.16	0.47
C36	CHANNEL	2.01	0 00:06	0.30	0.08	0.67
C37	CHANNEL	4.02	0 00:06	1.19	0.15	0.46
C38	CHANNEL	0.65	0 00:06	0.24	0.02	0.40
C39	CHANNEL	1.68	0 00:06	0.31	0.06	0.66
C40	CHANNEL	0.56	0 00:03	0.23	0.02	0.52
C41	CONDUIT	6.71	0 00:06	4.87	0.05	0.16
C42	CONDUIT	7.61	0 00:06	5.00	0.06	0.17
C43	CONDUIT	7.82	0 00:06	4.99	0.06	0.17
C44	CONDUIT	7.87	0 00:06	4.95	0.06	0.17

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.43	0.0000
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.44	0.0000
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.45	0.0000
C7	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.41	0.0000
C10	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.43	0.0000
C11	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.45	0.0000
C12	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.42	0.0000
C13	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.44	0.0000
C15	1.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	1.53	0.0000
C16	1.00	0.00	0.00	0.00	0.84	0.16	0.00	0.00	1.43	0.0000
C17	1.00	0.00	0.00	0.00	0.62	0.38	0.00	0.00	2.54	0.0000
C19	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.57	0.0000
C20	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.58	0.0000
C21	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.58	0.0000
C22	1.00	0.00	0.00	0.00	0.90	0.09	0.00	0.00	0.58	0.0000
C23	1.00	0.00	0.00	0.00	0.83	0.16	0.00	0.00	1.46	0.0000
C24	1.00	0.00	0.00	0.00	0.84	0.16	0.00	0.00	1.41	0.0000
C26	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.35	0.0000
C27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.22	0.0000
C28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.24	0.0000
C29	1.00	0.00	0.00	0.00	0.91	0.09	0.00	0.00	0.41	0.0000
C30	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.31	0.0000
C31	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.32	0.0000
C32	1.00	0.00	0.00	0.00	0.89	0.10	0.00	0.00	0.50	0.0000
C33	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.36	0.0000
C34	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.38	0.0000
C35	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.55	0.0000
C36	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0000
C37	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.27	0.0000
C38	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.15	0.0000
C39	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.18	0.0000
C40	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.04	0.0000
C41	1.00	0.00	0.00	0.00	0.84	0.15	0.00	0.00	1.50	0.0000
C42	1.00	0.00	0.00	0.00	0.83	0.16	0.00	0.00	1.57	0.0000
C43	1.00	0.00	0.00	0.00	0.78	0.22	0.00	0.00	1.89	0.0000
C44	1.00	0.00	0.00	0.00	0.82	0.18	0.00	0.00	1.62	0.0000

****

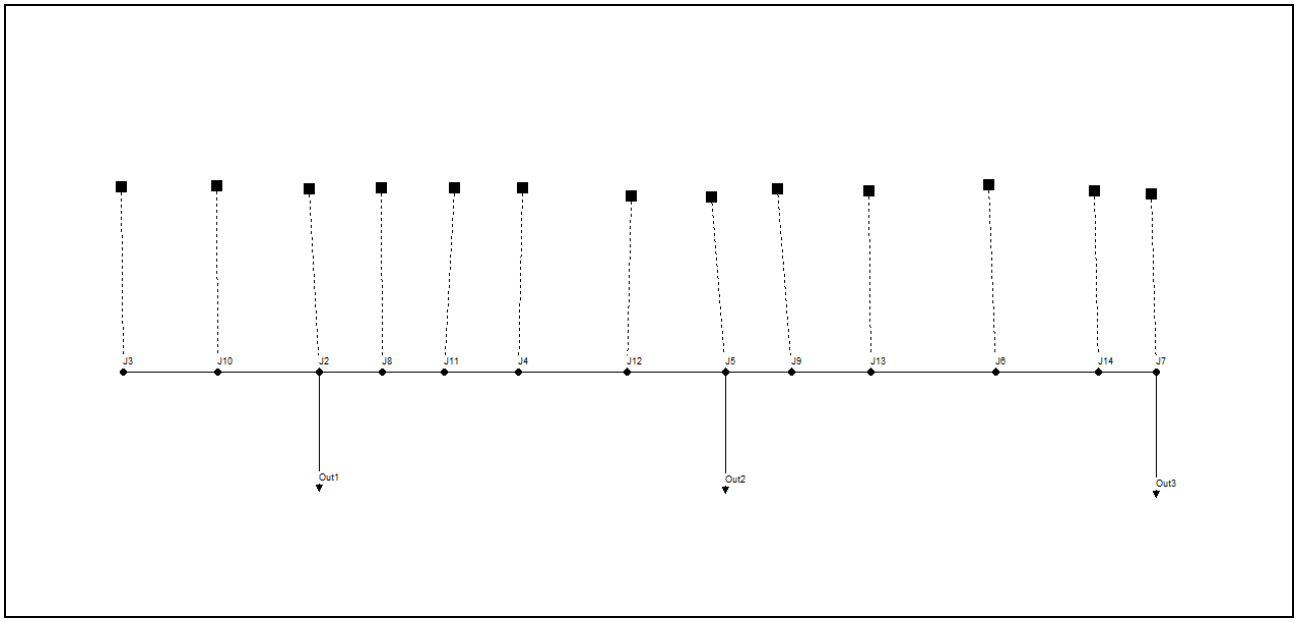
Conduit Surcharge Summary

****

No conduits were surcharged.

ALLEGATO 4: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA IN CURVA

STRADA Cat. C1 - Pendenza Long. 0.1%, Pendenza Trasv. ≥5% - PASSO EMBRICI 15m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:01
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.002        35.293
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.002        34.335
Final Surface Storage ....         0.000         0.958
Continuity Error (%) .....         0.000
**************************        Volume        Volume
```

```
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.002         0.019
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.002         0.019
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....       -0.361
*************************
Highest Continuity Errors
*************************
Node J14 (-1.58%)
Node J12 (-1.48%)
***************************
Time-Step Critical Elements
***************************
Link C16 (2.43%)
Link C14 (1.35%)
Link C12 (1.19%)
********************************
Highest Flow Instability Indexes
********************************
Link C14 (6)
Link C16 (6)
Link C12 (4)
Link C9 (3)
Link C6 (3)
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     0.75 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
***************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment         mm        mm        mm        mm        mm    10^6 ltr    LPS
-----------------------------------------------------------------------------------------------
S2                35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S3                35.29      0.00      0.00      0.00     34.34      0.00      1.84   0.973
S4                35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S5                35.29      0.00      0.00      0.00     34.34      0.00      1.84   0.973
S6                35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S7                35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S8                35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S9                35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S10               35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S11               35.29      0.00      0.00      0.00     34.34      0.00      3.06   0.973
S12               35.29      0.00      0.00      0.00     34.34      0.00      1.22   0.973
S13               35.29      0.00      0.00      0.00     34.34      0.00      1.22   0.973
S14               35.29      0.00      0.00      0.00     34.34      0.00      1.22   0.973
******************
Node Depth Summary
******************
-------------------------------------------------------------------
                       Average  Maximum  Maximum  Time of Max
                         Depth    Depth      HGL   Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J2          JUNCTION      0.00     0.02     0.02    0  00:05
J3          JUNCTION      0.03     0.10     0.10    0  00:05
J4          JUNCTION      0.03     0.10     0.09    0  00:05
J5          JUNCTION      0.00     0.02     0.01    0  00:05
```

J6	JUNCTION	0.03	0.10	0.07	0	00:05
J7	JUNCTION	0.00	0.02	-0.01	0	00:05
J8	JUNCTION	0.02	0.09	0.09	0	00:05
J9	JUNCTION	0.02	0.09	0.07	0	00:05
J10	JUNCTION	0.03	0.10	0.10	0	00:05
J11	JUNCTION	0.03	0.09	0.09	0	00:04
J12	JUNCTION	0.03	0.10	0.09	0	00:05
J13	JUNCTION	0.03	0.09	0.07	0	00:04
J14	JUNCTION	0.03	0.10	0.07	0	00:05
Out1	OUTFALL	0.00	0.01	-3.99	0	00:05
Out2	OUTFALL	0.00	0.02	-3.98	0	00:05
Out3	OUTFALL	0.00	0.02	-3.98	0	00:05

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	1.22	11.45	0 00:05	0.001	0.007
J3	JUNCTION	3.06	3.06	0 00:05	0.002	0.002
J4	JUNCTION	3.06	3.97	0 00:05	0.002	0.002
J5	JUNCTION	1.22	22.62	0 00:05	0.001	0.007
J6	JUNCTION	3.06	3.98	0 00:05	0.002	0.002
J7	JUNCTION	1.22	18.52	0 00:05	0.001	0.005
J8	JUNCTION	1.84	4.40	0 00:03	0.001	0.003
J9	JUNCTION	1.84	4.39	0 00:03	0.001	0.003
J10	JUNCTION	3.06	6.12	0 00:05	0.002	0.004
J11	JUNCTION	3.06	3.63	0 00:03	0.002	0.002
J12	JUNCTION	3.06	7.12	0 00:05	0.002	0.004
J13	JUNCTION	3.06	3.63	0 00:03	0.002	0.002
J14	JUNCTION	3.06	7.13	0 00:05	0.002	0.004
Out1	OUTFALL	0.00	11.45	0 00:05	0.000	0.007
Out2	OUTFALL	0.00	18.05	0 00:05	0.000	0.007
Out3	OUTFALL	0.00	13.82	0 00:05	0.000	0.005

****
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
J12	JUNCTION	0.01	0.000	0.000
J14	JUNCTION	0.01	0.000	0.000

****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	47.76	4.10	11.45	0.007
Out2	59.40	3.39	18.05	0.007
Out3	59.56	2.10	13.82	0.005
System	55.57	9.59	43.32	0.019

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

C2	CONDUIT	11.45	0	00:05	2.50	0.05	0.15
C3	CHANNEL	3.06	0	00:05	0.22	0.49	0.98
C4	CHANNEL	2.57	0	00:03	0.22	0.41	0.92
C5	CHANNEL	4.06	0	00:05	0.22	0.65	0.99
C6	CONDUIT	18.05	0	00:05	2.94	0.08	0.20
C7	CHANNEL	2.56	0	00:03	0.22	0.41	0.92
C8	CHANNEL	4.07	0	00:05	0.22	0.65	0.99
C9	CONDUIT	13.82	0	00:05	2.67	0.06	0.17
C10	CHANNEL	4.15	0	00:05	1.09	0.66	0.53
C11	CHANNEL	4.15	0	00:05	1.08	0.66	0.56
C12	CHANNEL	6.12	0	00:05	1.31	0.98	0.58
C13	CHANNEL	0.91	0	00:05	0.11	0.15	0.96
C14	CHANNEL	17.29	0	00:05	3.13	2.77	0.61
C15	CHANNEL	0.92	0	00:05	0.11	0.15	0.96
C16	CHANNEL	17.30	0	00:05	3.39	2.77	0.60

****

Flow Classification Summary

****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.18	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.19	0.0003
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.18	0.0003
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.28	0.0005
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.39	0.0001
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.18	0.0003
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.28	0.0005
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.30	0.0001
C10	1.00	0.02	0.00	0.00	0.69	0.29	0.00	0.00	0.57	0.0004
C11	1.00	0.02	0.00	0.00	0.69	0.29	0.00	0.00	0.57	0.0004
C12	1.00	0.02	0.00	0.00	0.48	0.50	0.00	0.00	1.01	0.0054
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.15	0.0002
C14	1.00	0.02	0.00	0.00	0.29	0.69	0.00	0.00	1.22	0.0141
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.15	0.0002
C16	1.00	0.02	0.00	0.00	0.29	0.69	0.00	0.00	1.25	0.0147

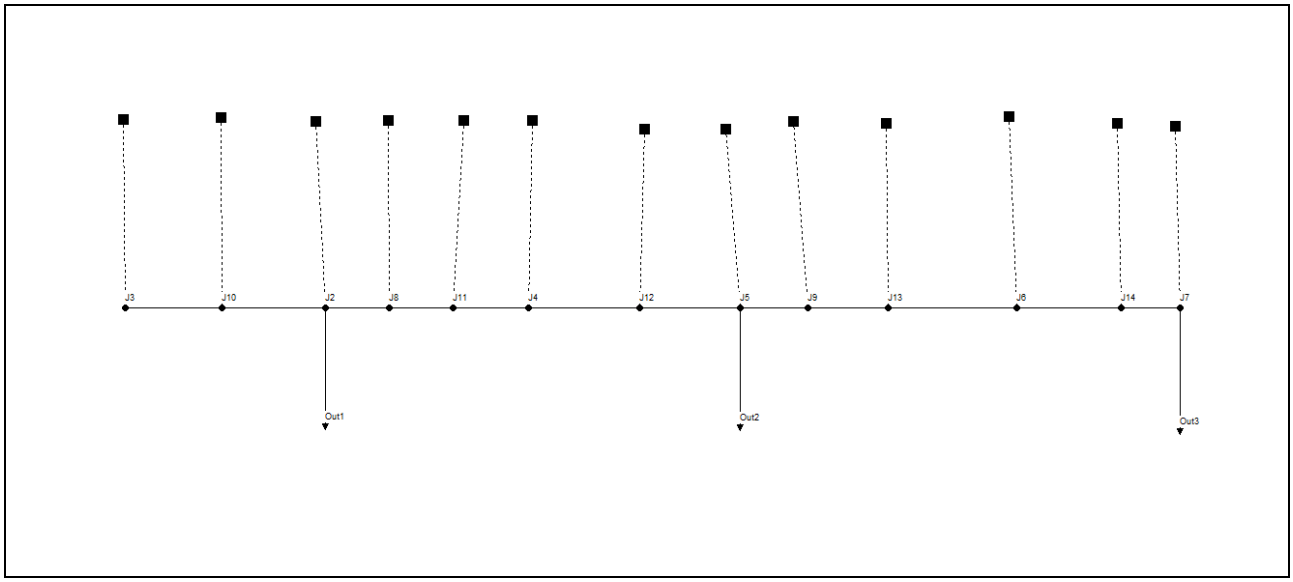
****

Conduit Surcharge Summary

****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C14	0.01	0.01	0.01	0.01	0.01
C16	0.01	0.01	0.01	0.01	0.01

STRADA Cat. C1 - Pendenza Long. 0.8%, Pendenza Trasv. ≥5% - PASSO EMBRICI 20m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.003        35.500
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.003        34.546
Final Surface Storage ....         0.000         0.959
Continuity Error (%) .....         0.000
*************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
```

```
  Wet Weather Inflow .....        0.003        0.027
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow ..............      0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.003        0.027
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.000
  ***************************
  Time-Step Critical Elements
  ***************************
  None
  *********************************
  Highest Flow Instability Indexes
  *********************************
  Link C14 (1)
  Link C16 (1)
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step          :     1.00 sec
  Average Time Step          :     1.00 sec
  Maximum Time Step          :     1.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ****************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                     Total     Total     Total     Total     Total     Total     Peak  Runoff
                    Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
  Subcatchment          mm        mm        mm        mm        mm    10^6 ltr      LPS
  ---------------------------------------------------------------------------------------------------
  S2                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S3                 35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
  S4                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S5                 35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
  S6                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S7                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S8                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S9                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S10                35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S11                35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S12                35.50      0.00      0.00      0.00     34.55      0.00     1.75   0.973
  S13                35.50      0.00      0.00      0.00     34.55      0.00     1.75   0.973
  S14                35.50      0.00      0.00      0.00     34.55      0.00     1.75   0.973
  ******************
  Node Depth Summary
  ******************
  -----------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -----------------------------------------------------------------
  J2          JUNCTION      0.00     0.02     0.02     0  00:06
  J3          JUNCTION      0.02     0.07     0.13     0  00:06
  J4          JUNCTION      0.02     0.09    -0.01     0  00:06
  J5          JUNCTION      0.00     0.02    -0.14     0  00:06
  J6          JUNCTION      0.02     0.09    -0.17     0  00:06
  J7          JUNCTION      0.00     0.02    -0.30     0  00:06
  J8          JUNCTION      0.01     0.05     0.03     0  00:06
  J9          JUNCTION      0.01     0.05    -0.13     0  00:06
  J10          JUNCTION     0.02     0.08     0.10     0  00:06
  J11          JUNCTION     0.02     0.08     0.01     0  00:06
  J12          JUNCTION     0.03     0.10    -0.05     0  00:06
  J13          JUNCTION     0.02     0.08    -0.15     0  00:06
  J14          JUNCTION     0.03     0.10    -0.21     0  00:06
  Out1          OUTFALL     0.00     0.01    -3.99     0  00:06
  Out2          OUTFALL     0.00     0.02    -3.98     0  00:06
  Out3          OUTFALL     0.00     0.02    -3.98     0  00:06
  *******************
```

Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	1.75	11.03	0 00:06	0.001	0.006
J3	JUNCTION	4.37	4.37	0 00:06	0.003	0.003
J4	JUNCTION	4.37	10.84	0 00:06	0.003	0.007
J5	JUNCTION	1.75	17.48	0 00:06	0.001	0.010
J6	JUNCTION	4.37	10.86	0 00:06	0.003	0.007
J7	JUNCTION	1.75	16.99	0 00:06	0.001	0.010
J8	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J9	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J10	JUNCTION	4.37	8.75	0 00:06	0.003	0.005
J11	JUNCTION	4.37	6.47	0 00:06	0.003	0.004
J12	JUNCTION	4.37	15.22	0 00:06	0.003	0.009
J13	JUNCTION	4.37	6.49	0 00:06	0.003	0.004
J14	JUNCTION	4.37	15.24	0 00:06	0.003	0.009
Out1	OUTFALL	0.00	11.03	0 00:06	0.000	0.006
Out2	OUTFALL	0.00	17.48	0 00:06	0.000	0.010
Out3	OUTFALL	0.00	16.99	0 00:06	0.000	0.010

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	44.74	3.97	11.03	0.006
Out2	53.65	5.32	17.48	0.010
Out3	54.62	5.20	16.99	0.010
System	51.00	14.48	45.49	0.027

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	11.03	0 00:06	2.46	0.05	0.15
C3	CHANNEL	4.37	0 00:06	0.44	0.25	0.77
C4	CHANNEL	2.10	0 00:03	0.35	0.12	0.65
C5	CHANNEL	10.84	0 00:06	0.52	0.61	0.93
C6	CONDUIT	17.48	0 00:06	2.88	0.08	0.20
C7	CHANNEL	2.11	0 00:06	0.35	0.12	0.66
C8	CHANNEL	10.86	0 00:06	0.52	0.61	0.93
C9	CONDUIT	16.99	0 00:06	2.80	0.08	0.20
C10	CHANNEL	0.53	0 00:06	0.23	0.03	0.34
C11	CHANNEL	0.51	0 00:06	0.20	0.03	0.37
C12	CHANNEL	8.75	0 00:06	2.34	0.49	0.50
C13	CHANNEL	6.47	0 00:06	0.46	0.37	0.84
C14	CHANNEL	15.22	0 00:06	2.93	0.86	0.59
C15	CHANNEL	6.49	0 00:06	0.46	0.37	0.84
C16	CHANNEL	15.24	0 00:06	2.94	0.86	0.59

****
Flow Classification Summary
****

Adjusted --- Fraction of Time in Flow Class ---- Avg. Avg.

Conduit	/Actual Length	Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Froude Number	Flow Change
C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.10	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.48	0.0001
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.46	0.0001
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.66	0.0003
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.26	0.0000
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.48	0.0001
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.66	0.0003
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.17	0.0000
C10	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.16	0.0000
C11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.22	0.0000
C12	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	1.90	0.0003
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.62	0.0002
C14	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	2.32	0.0005
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.63	0.0002
C16	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	2.33	0.0005

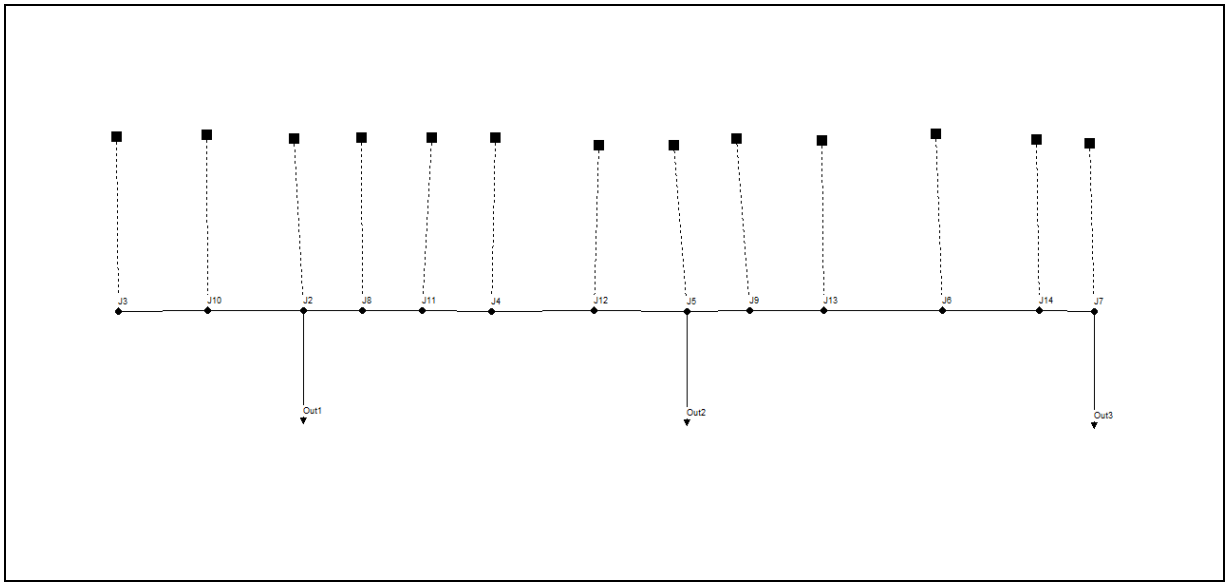
****

Conduit Surcharge Summary

****

No conduits were surcharged.

RAMPA - PENDENZA 0.1% - PASSO EMBRICI 20m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:01
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.001        35.293
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.001        34.335
Final Surface Storage ....        0.000         0.958
Continuity Error (%) .....        0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
Dry Weather Inflow .......        0.000         0.000
```

```
  Wet Weather Inflow .....        0.001        0.012
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow ..............      0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.001        0.012
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.274
  ***************************
  Time-Step Critical Elements
  ***************************
  None
  *********************************
  Highest Flow Instability Indexes
  *********************************
  Link C14 (4)
  Link C16 (4)
  Link C6 (4)
  Link C9 (3)
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step          :     1.00 sec
  Average Time Step          :     1.00 sec
  Maximum Time Step          :     1.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ****************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                        Total     Total     Total     Total     Total     Total     Peak  Runoff
                        Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
  Subcatchment             mm        mm        mm        mm        mm    10^6 ltr    LPS
  ---------------------------------------------------------------------------------------------------
  S2                     35.29      0.00      0.00      0.00     34.34      0.00     2.04  0.973
  S3                     35.29      0.00      0.00      0.00     34.34      0.00     1.22  0.973
  S4                     35.29      0.00      0.00      0.00     34.34      0.00     2.04  0.973
  S5                     35.29      0.00      0.00      0.00     34.34      0.00     1.22  0.973
  S6                     35.29      0.00      0.00      0.00     34.34      0.00     2.04  0.973
  S7                     35.29      0.00      0.00      0.00     34.34      0.00     2.04  0.973
  S8                     35.29      0.00      0.00      0.00     34.34      0.00     2.04  0.973
  S9                     35.29      0.00      0.00      0.00     34.32      0.00     2.04  0.973
  S10                    35.29      0.00      0.00      0.00     34.34      0.00     2.04  0.973
  S11                    35.29      0.00      0.00      0.00     34.34      0.00     2.04  0.973
  S12                    35.29      0.00      0.00      0.00     34.34      0.00     0.82  0.973
  S13                    35.29      0.00      0.00      0.00     34.34      0.00     0.82  0.973
  S14                    35.29      0.00      0.00      0.00     34.34      0.00     0.82  0.973
  ******************
  Node Depth Summary
  ******************
  -----------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -----------------------------------------------------------------------
  J2          JUNCTION       0.00     0.01     0.01    0  00:05
  J3          JUNCTION       0.01     0.04     0.05    0  00:05
  J4          JUNCTION       0.02     0.05     0.04    0  00:06
  J5          JUNCTION       0.00     0.01    -0.01    0  00:05
  J6          JUNCTION       0.02     0.05     0.02    0  00:05
  J7          JUNCTION       0.00     0.01    -0.03    0  00:05
  J8          JUNCTION       0.01     0.04     0.04    0  00:05
  J9          JUNCTION       0.01     0.04     0.02    0  00:05
  J10         JUNCTION       0.01     0.04     0.04    0  00:05
  J11         JUNCTION       0.01     0.04     0.04    0  00:05
  J12         JUNCTION       0.02     0.05     0.03    0  00:05
  J13         JUNCTION       0.01     0.04     0.02    0  00:05
  J14         JUNCTION       0.02     0.05     0.01    0  00:05
  Out1        OUTFALL        0.00     0.01    -3.99    0  00:05
  Out2        OUTFALL        0.00     0.01    -3.99    0  00:05
```

```
Out3             OUTFALL      0.00     0.01    -3.99     0  00:05
********************
Node Inflow Summary
********************
-------------------------------------------------------------------------------
                          Maximum  Maximum                 Lateral       Total
                          Lateral    Total  Time of Max     Inflow      Inflow
                           Inflow   Inflow   Occurrence     Volume      Volume
Node             Type         LPS      LPS  days hr:min    10^6 ltr    10^6 ltr
-------------------------------------------------------------------------------
J2             JUNCTION      0.82     6.62     0  00:05       0.000       0.004
J3             JUNCTION      2.04     2.04     0  00:05       0.001       0.001
J4             JUNCTION      2.04     3.65     0  00:03       0.001       0.002
J5             JUNCTION      0.82     9.98     0  00:05       0.000       0.005
J6             JUNCTION      2.04     3.65     0  00:03       0.001       0.002
J7             JUNCTION      0.82     8.14     0  00:05       0.000       0.004
J8             JUNCTION      1.22     1.73     0  00:05       0.001       0.001
J9             JUNCTION      1.22     1.78     0  00:05       0.001       0.001
J10             JUNCTION      2.04     4.08     0  00:05       0.001       0.002
J11             JUNCTION      2.04     2.04     0  00:05       0.001       0.001
J12             JUNCTION      2.04     5.61     0  00:05       0.001       0.004
J13             JUNCTION      2.04     2.04     0  00:05       0.001       0.001
J14             JUNCTION      2.04     5.58     0  00:05       0.001       0.004
Out1             OUTFALL      0.00     6.62     0  00:05       0.000       0.004
Out2             OUTFALL      0.00     8.39     0  00:05       0.000       0.005
Out3             OUTFALL      0.00     6.63     0  00:05       0.000       0.004
**********************
Node Surcharge Summary
**********************
No nodes were surcharged.
*********************
Node Flooding Summary
*********************
No nodes were flooded.
**********************
Outfall Loading Summary
**********************
-------------------------------------------------------------
                 Flow      Avg.      Max.      Total
                 Freq.     Flow      Flow     Volume
Outfall Node      Pcnt.      LPS       LPS    10^6 ltr
-------------------------------------------------------------
Out1             41.99      2.41      6.62      0.004
Out2             55.46      2.40      8.39      0.005
Out3             54.10      2.04      6.63      0.004
-------------------------------------------------------------
System           50.51      6.85     21.23      0.012
********************
Link Flow Summary
********************
-----------------------------------------------------------------------------
                          Maximum  Time of Max   Maximum    Max/    Max/
                           |Flow|   Occurrence   |Veloc|    Full    Full
Link             Type         LPS  days hr:min     m/sec    Flow   Depth
-----------------------------------------------------------------------------
C2             CONDUIT      6.62    0  00:05      2.03    0.08    0.22
C3             CHANNEL      2.04    0  00:05      0.20    0.56    0.76
C4             CHANNEL      0.51    0  00:05      0.04    0.14    0.84
C5             CHANNEL      3.58    0  00:05      0.25    0.97    0.96
C6             CONDUIT      8.39    0  00:05      2.23    0.11    0.25
C7             CHANNEL      0.55    0  00:06      0.04    0.15    0.83
C8             CHANNEL      3.54    0  00:05      0.25    0.96    0.95
C9             CONDUIT      6.63    0  00:05      2.04    0.08    0.22
C10             CHANNEL      1.73    0  00:06      0.38    0.47    0.51
C11             CHANNEL      1.78    0  00:06      0.37    0.48    0.52
C12             CHANNEL      4.08    0  00:05      0.98    1.11    0.49
C13             CHANNEL      1.61    0  00:03      0.11    0.44    0.93
C14             CHANNEL      7.39    0  00:05      1.14    2.01    0.61
C15             CHANNEL      1.61    0  00:03      0.11    0.44    0.92
C16             CHANNEL      7.33    0  00:05      1.20    1.99    0.58
***************************
Flow Classification Summary
***************************
```

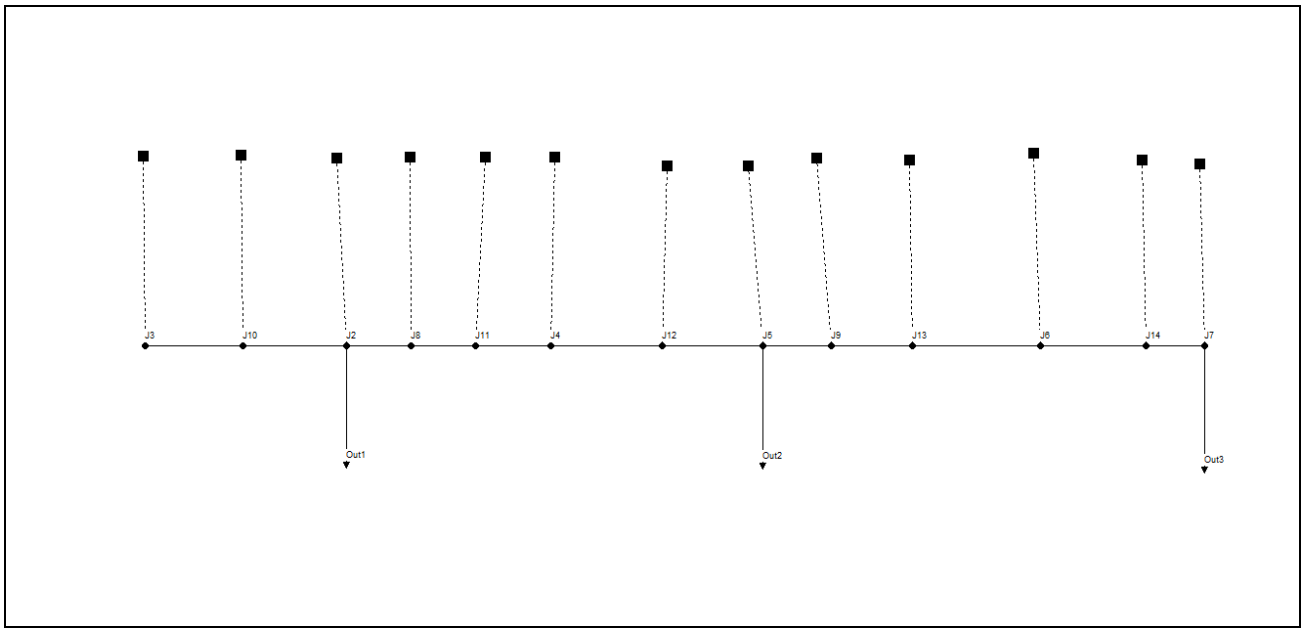
Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.00	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.24	0.0003
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.12	0.0001
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.32	0.0008
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.28	0.0002
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.12	0.0001
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.33	0.0008
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.22	0.0002
C10	1.00	0.02	0.00	0.00	0.92	0.06	0.00	0.00	0.29	0.0003
C11	1.00	0.02	0.00	0.00	0.94	0.04	0.00	0.00	0.27	0.0003
C12	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	1.74	0.0006
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.21	0.0003
C14	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	1.92	0.0320
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.21	0.0003
C16	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	1.95	0.0313

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C12	0.01	0.01	0.01	0.06	0.01
C14	0.01	0.01	0.01	0.06	0.01
C16	0.01	0.01	0.01	0.06	0.01

STRADA CAT. B – CARREGGIATA INTERNA

Pendenza Long. 0.1%, Pendenza Trasv. ≥5% - PASSO EMBRICI 15m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.002        35.500
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.002        34.549
Final Surface Storage ....         0.000         0.957
Continuity Error (%) .....         0.000
**************************        Volume        Volume
```

```
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.002         0.016
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.002         0.016
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
**************************

Time-Step Critical Elements
**************************
Link C16 (1.93%)
Link C12 (1.55%)
Link C14 (1.16%)
*******************************

Highest Flow Instability Indexes
*******************************
Link C14 (5)
Link C16 (5)
Link C12 (4)
Link C9 (2)
Link C6 (1)
*************************

Routing Time Step Summary
*************************
Minimum Time Step          :     0.76 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
***************************

Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------------
                   Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment          mm        mm        mm        mm        mm    10^6 ltr    LPS
-----------------------------------------------------------------------------------------------------
S2                 35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S3                 35.50      0.00      0.00      0.00     34.55      0.00     1.58  0.973
S4                 35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S5                 35.50      0.00      0.00      0.00     34.55      0.00     1.58  0.973
S6                 35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S7                 35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S8                 35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S9                 35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S10                35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S11                35.50      0.00      0.00      0.00     34.55      0.00     2.63  0.973
S12                35.50      0.00      0.00      0.00     34.55      0.00     1.05  0.973
S13                35.50      0.00      0.00      0.00     34.55      0.00     1.05  0.973
S14                35.50      0.00      0.00      0.00     34.55      0.00     1.05  0.973
******************

Node Depth Summary
******************
-------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
Node          Type        Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J2          JUNCTION       0.00     0.02     0.02    0  00:06
J3          JUNCTION       0.02     0.09     0.10    0  00:06
J4          JUNCTION       0.03     0.09     0.08    0  00:06
J5          JUNCTION       0.00     0.02     0.00    0  00:06
J6          JUNCTION       0.03     0.09     0.07    0  00:06
J7          JUNCTION       0.00     0.01    -0.02    0  00:06
J8          JUNCTION       0.02     0.08     0.08    0  00:06
J9          JUNCTION       0.02     0.08     0.07    0  00:06
J10          JUNCTION      0.03     0.10     0.10    0  00:06
```

J11	JUNCTION	0.02	0.09	0.08	0	00:06
J12	JUNCTION	0.03	0.10	0.08	0	00:06
J13	JUNCTION	0.02	0.09	0.07	0	00:06
J14	JUNCTION	0.03	0.10	0.07	0	00:06
Out1	OUTFALL	0.00	0.01	-3.99	0	00:06
Out2	OUTFALL	0.00	0.01	-3.99	0	00:06
Out3	OUTFALL	0.00	0.01	-3.99	0	00:06

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	1.05	10.28	0 00:06	0.001	0.006
J3	JUNCTION	2.63	2.63	0 00:06	0.002	0.002
J4	JUNCTION	2.63	2.82	0 00:05	0.002	0.002
J5	JUNCTION	1.05	10.46	0 00:06	0.001	0.006
J6	JUNCTION	2.63	2.82	0 00:05	0.002	0.002
J7	JUNCTION	1.05	6.47	0 00:06	0.001	0.004
J8	JUNCTION	1.58	4.00	0 00:05	0.001	0.002
J9	JUNCTION	1.58	4.00	0 00:05	0.001	0.002
J10	JUNCTION	2.63	5.25	0 00:05	0.002	0.003
J11	JUNCTION	2.63	3.16	0 00:03	0.002	0.002
J12	JUNCTION	2.63	5.43	0 00:06	0.002	0.003
J13	JUNCTION	2.63	3.15	0 00:03	0.002	0.002
J14	JUNCTION	2.63	5.43	0 00:06	0.002	0.003
Out1	OUTFALL	0.00	10.28	0 00:06	0.000	0.006
Out2	OUTFALL	0.00	10.46	0 00:06	0.000	0.006
Out3	OUTFALL	0.00	6.47	0 00:06	0.000	0.004

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	46.41	3.68	10.28	0.006
Out2	57.82	2.98	10.46	0.006
Out3	57.96	1.80	6.47	0.004
System	54.06	8.46	27.21	0.016

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	10.28	0 00:06	2.40	0.05	0.14
C3	CHANNEL	2.62	0 00:05	0.22	0.42	0.94
C4	CHANNEL	2.42	0 00:05	0.21	0.39	0.87
C5	CHANNEL	2.80	0 00:06	0.23	0.45	0.95
C6	CONDUIT	10.46	0 00:06	2.41	0.05	0.14
C7	CHANNEL	2.42	0 00:05	0.21	0.39	0.87
C8	CHANNEL	2.80	0 00:06	0.23	0.45	0.95
C9	CONDUIT	6.47	0 00:06	2.00	0.03	0.11
C10	CHANNEL	3.99	0 00:06	1.08	0.64	0.50
C11	CHANNEL	3.99	0 00:06	1.07	0.64	0.50
C12	CHANNEL	5.25	0 00:06	1.32	0.84	0.55
C13	CHANNEL	0.55	0 00:03	0.11	0.09	0.92

C14	CHANNEL	5.42	0	00:06	1.32	0.87	0.56
C15	CHANNEL	0.55	0	00:03	0.11	0.09	0.92
C16	CHANNEL	5.42	0	00:06	1.29	0.87	0.54

****

Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
		--- Fraction of Time in Flow Class ----							
C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.13	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.19	0.0003
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.18	0.0002
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.27	0.0003
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.34	0.0000
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.18	0.0002
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.27	0.0003
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.25	0.0000
C10	1.00	0.02	0.00	0.00	0.70	0.28	0.00	0.00	0.54	0.0004
C11	1.00	0.02	0.00	0.00	0.70	0.28	0.00	0.00	0.55	0.0004
C12	1.00	0.02	0.00	0.00	0.50	0.48	0.00	0.00	0.95	0.0054
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.15	0.0002
C14	1.00	0.02	0.00	0.00	0.31	0.68	0.00	0.00	1.15	0.0059
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.15	0.0001
C16	1.00	0.02	0.00	0.00	0.31	0.68	0.00	0.00	1.18	0.0056

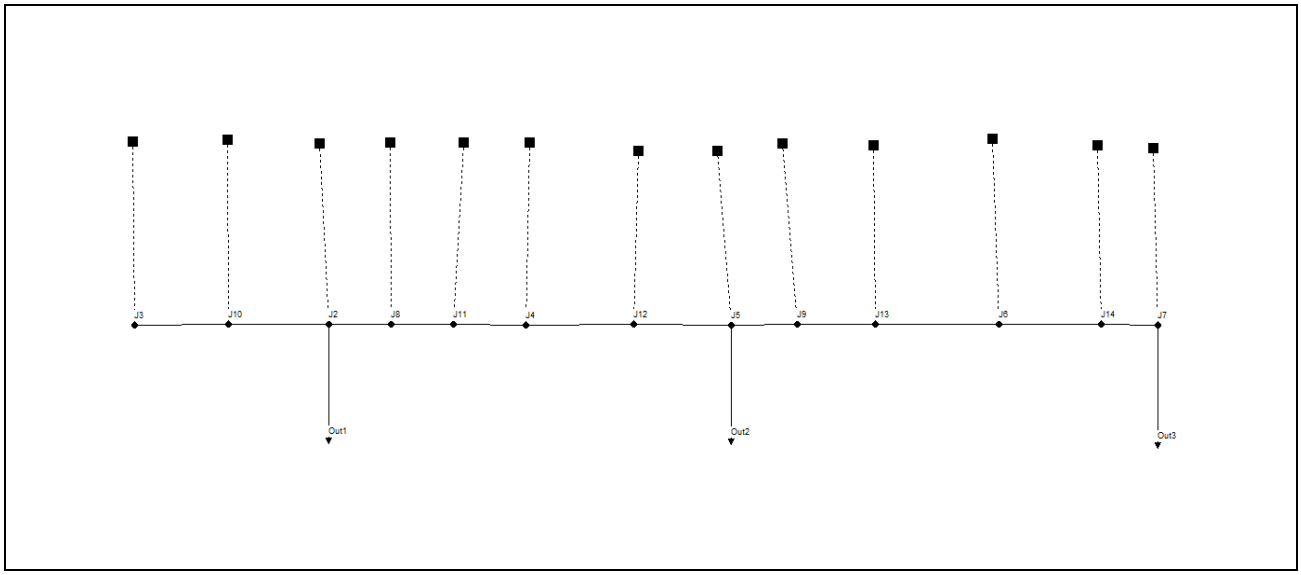
****

Conduit Surcharge Summary
****

No conduits were surcharged.

STRADA CAT. B – CARREGGIATA INTERNA

Pendenza Long. 0.8%, Pendenza Trasv. ≥5% - PASSO EMBRICI 20m



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.003        35.500
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.003        34.546
Final Surface Storage ....         0.000         0.959
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------      ---------
```

```
  Dry Weather Inflow .....        0.000        0.000
  Wet Weather Inflow .....        0.003        0.027
  Groundwater Inflow .....        0.000        0.000
  RDII Inflow .............       0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.003        0.027
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.000
  ***************************
  Time-Step Critical Elements
  ***************************
  None
  *********************************
  Highest Flow Instability Indexes
  *********************************
  Link C14 (1)
  Link C16 (1)
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step          :     1.00 sec
  Average Time Step          :     1.00 sec
  Maximum Time Step          :     1.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ***************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                        Total     Total     Total     Total     Total     Total     Peak  Runoff
                       Precip     Runon      Evap      Infil    Runoff    Runoff    Runoff   Coeff
  Subcatchment             mm        mm        mm        mm        mm    10^6 ltr     LPS
  ---------------------------------------------------------------------------------------------------
  S2                    35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S3                    35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
  S4                    35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S5                    35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
  S6                    35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S7                    35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S8                    35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S9                    35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S10                   35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S11                   35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
  S12                   35.50      0.00      0.00      0.00     34.55      0.00     1.75   0.973
  S13                   35.50      0.00      0.00      0.00     34.55      0.00     1.75   0.973
  S14                   35.50      0.00      0.00      0.00     34.55      0.00     1.75   0.973
  *****************
  Node Depth Summary
  *****************
  -----------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -----------------------------------------------------------------------
  J2          JUNCTION       0.00     0.02     0.02    0  00:06
  J3          JUNCTION       0.02     0.07     0.13    0  00:06
  J4          JUNCTION       0.02     0.09    -0.01    0  00:06
  J5          JUNCTION       0.00     0.02    -0.14    0  00:06
  J6          JUNCTION       0.02     0.09    -0.17    0  00:06
  J7          JUNCTION       0.00     0.02    -0.30    0  00:06
  J8          JUNCTION       0.01     0.05     0.03    0  00:06
  J9          JUNCTION       0.01     0.05    -0.13    0  00:06
  J10         JUNCTION       0.02     0.08     0.10    0  00:06
  J11         JUNCTION       0.02     0.08     0.01    0  00:06
  J12         JUNCTION       0.03     0.10    -0.05    0  00:06
  J13         JUNCTION       0.02     0.08    -0.15    0  00:06
  J14         JUNCTION       0.03     0.10    -0.21    0  00:06
  Out1        OUTFALL        0.00     0.01    -3.99    0  00:06
  Out2        OUTFALL        0.00     0.02    -3.98    0  00:06
  Out3        OUTFALL        0.00     0.02    -3.98    0  00:06
```

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	1.75	11.03	0 00:06	0.001	0.006
J3	JUNCTION	4.37	4.37	0 00:06	0.003	0.003
J4	JUNCTION	4.37	10.84	0 00:06	0.003	0.007
J5	JUNCTION	1.75	17.48	0 00:06	0.001	0.010
J6	JUNCTION	4.37	10.86	0 00:06	0.003	0.007
J7	JUNCTION	1.75	16.99	0 00:06	0.001	0.010
J8	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J9	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J10	JUNCTION	4.37	8.75	0 00:06	0.003	0.005
J11	JUNCTION	4.37	6.47	0 00:06	0.003	0.004
J12	JUNCTION	4.37	15.22	0 00:06	0.003	0.009
J13	JUNCTION	4.37	6.49	0 00:06	0.003	0.004
J14	JUNCTION	4.37	15.24	0 00:06	0.003	0.009
Out1	OUTFALL	0.00	11.03	0 00:06	0.000	0.006
Out2	OUTFALL	0.00	17.48	0 00:06	0.000	0.010
Out3	OUTFALL	0.00	16.99	0 00:06	0.000	0.010

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	44.74	3.97	11.03	0.006
Out2	53.65	5.32	17.48	0.010
Out3	54.62	5.20	16.99	0.010
System	51.00	14.48	45.49	0.027

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	11.03	0 00:06	2.46	0.05	0.15
C3	CHANNEL	4.37	0 00:06	0.44	0.25	0.77
C4	CHANNEL	2.10	0 00:03	0.35	0.12	0.65
C5	CHANNEL	10.84	0 00:06	0.52	0.61	0.93
C6	CONDUIT	17.48	0 00:06	2.88	0.08	0.20
C7	CHANNEL	2.11	0 00:06	0.35	0.12	0.66
C8	CHANNEL	10.86	0 00:06	0.52	0.61	0.93
C9	CONDUIT	16.99	0 00:06	2.80	0.08	0.20
C10	CHANNEL	0.53	0 00:06	0.23	0.03	0.34
C11	CHANNEL	0.51	0 00:06	0.20	0.03	0.37
C12	CHANNEL	8.75	0 00:06	2.34	0.49	0.50
C13	CHANNEL	6.47	0 00:06	0.46	0.37	0.84
C14	CHANNEL	15.22	0 00:06	2.93	0.86	0.59
C15	CHANNEL	6.49	0 00:06	0.46	0.37	0.84
C16	CHANNEL	15.24	0 00:06	2.94	0.86	0.59

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C2	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.10	0.0000
C3	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.48	0.0001
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.46	0.0001
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.66	0.0003
C6	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.26	0.0000
C7	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.48	0.0001
C8	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.66	0.0003
C9	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	4.17	0.0000
C10	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.16	0.0000
C11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.22	0.0000
C12	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	1.90	0.0003
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.62	0.0002
C14	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	2.32	0.0005
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.63	0.0002
C16	1.00	0.02	0.00	0.00	0.00	0.98	0.00	0.00	2.33	0.0005

****

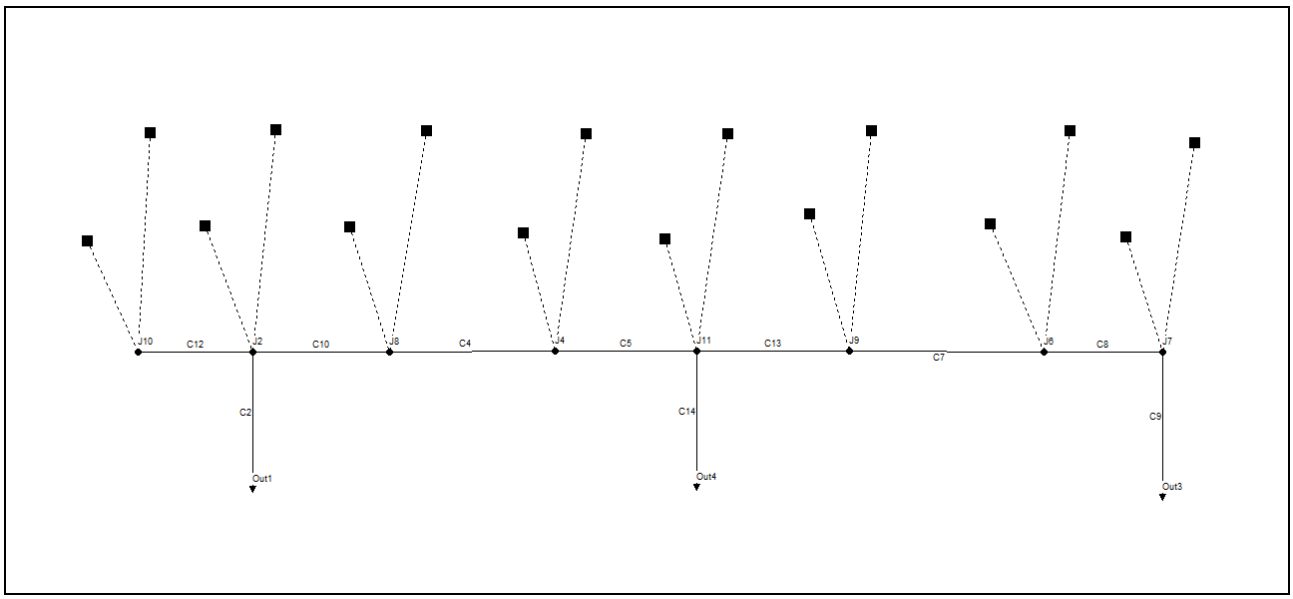
Conduit Surcharge Summary

****

No conduits were surcharged.

STRADA CAT. B – CARREGGIATA ESTERNA

Pendenza Long. 0.1%, Pendenza Trasv. ≥5% - PASSO SCARICHI 20m



- Durata 15' – T_R100anni)

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:10
Wet Time Step ............ 00:00:01
Dry Time Step ............ 00:00:10
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.004        45.863
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.004        44.906
Final Surface Storage ....         0.000         0.958
Continuity Error (%) .....         0.000
**************************       Volume        Volume
```

```
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.004         0.042
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.004         0.042
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
**************************

Time-Step Critical Elements
***************************
Link C14 (27.51%)
Link C2 (4.41%)
********************************

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

Routing Time Step Summary
*************************
Minimum Time Step          :     0.50 sec
Average Time Step          :     0.84 sec
Maximum Time Step          :     1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S3	45.86	0.00	0.00	0.00	44.90	0.00	9.23	0.979
S4	45.86	0.00	0.00	0.00	44.90	0.01	15.39	0.979
S5	45.86	0.00	0.00	0.00	44.90	0.00	9.23	0.979
S6	45.86	0.00	0.00	0.00	44.90	0.01	15.39	0.979
S8	45.86	0.00	0.00	0.00	44.91	0.00	1.55	0.979
S9	45.86	0.00	0.00	0.00	44.91	0.00	2.58	0.979
S10	45.86	0.00	0.00	0.00	44.91	0.00	1.55	0.979
S11	45.86	0.00	0.00	0.00	44.91	0.00	2.58	0.979
S12	45.86	0.00	0.00	0.00	44.91	0.00	1.03	0.979
S13	45.86	0.00	0.00	0.00	44.90	0.00	6.15	0.979
S14	45.86	0.00	0.00	0.00	44.91	0.00	2.58	0.979
S15	45.86	0.00	0.00	0.00	44.90	0.01	15.39	0.979
S16	45.86	0.00	0.00	0.00	44.91	0.00	1.03	0.979
S17	45.86	0.00	0.00	0.00	44.90	0.00	6.15	0.979
S18	45.86	0.00	0.00	0.00	44.91	0.00	1.03	0.979
S19	45.86	0.00	0.00	0.00	44.90	0.00	6.15	0.979

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J2	JUNCTION	0.02	0.07	0.07	0 00:08
J4	JUNCTION	0.04	0.13	0.11	0 00:08
J6	JUNCTION	0.04	0.12	0.09	0 00:08
J7	JUNCTION	0.02	0.06	0.02	0 00:08
J8	JUNCTION	0.03	0.12	0.11	0 00:08
J9	JUNCTION	0.03	0.12	0.09	0 00:08
J10	JUNCTION	0.03	0.12	0.12	0 00:08
J11	JUNCTION	0.02	0.07	0.05	0 00:08
Out1	OUTFALL	0.02	0.06	-0.44	0 00:08
Out3	OUTFALL	0.02	0.06	-0.48	0 00:08
Out4	OUTFALL	0.02	0.07	-0.45	0 00:08

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	7.19	33.85	0 00:08	0.003	0.015
J4	JUNCTION	17.96	19.92	0 00:08	0.008	0.009
J6	JUNCTION	17.96	20.16	0 00:08	0.008	0.009
J7	JUNCTION	7.19	27.25	0 00:08	0.003	0.012
J8	JUNCTION	10.78	10.78	0 00:08	0.005	0.005
J9	JUNCTION	10.78	10.78	0 00:08	0.005	0.005
J10	JUNCTION	17.96	17.96	0 00:08	0.008	0.008
J11	JUNCTION	7.19	35.49	0 00:08	0.003	0.016
Out1	OUTFALL	0.00	33.81	0 00:08	0.000	0.015
Out3	OUTFALL	0.00	27.22	0 00:08	0.000	0.012
Out4	OUTFALL	0.00	35.44	0 00:08	0.000	0.015

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	49.52	13.58	33.81	0.015
Out3	67.65	8.14	27.22	0.012
Out4	59.79	11.77	35.44	0.015
System	58.99	33.49	96.47	0.042

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	33.81	0 00:08	3.97	0.25	0.35
C4	CONDUIT	2.34	0 00:08	0.10	0.23	0.53
C5	CONDUIT	19.82	0 00:08	1.03	1.92	0.42
C7	CONDUIT	2.54	0 00:08	0.11	0.25	0.52
C8	CONDUIT	20.07	0 00:08	1.11	1.94	0.40
C9	CONDUIT	27.22	0 00:08	3.74	0.20	0.31
C10	CONDUIT	8.73	0 00:08	0.48	0.85	0.40
C12	CONDUIT	17.93	0 00:08	0.97	1.74	0.40
C13	CONDUIT	8.48	0 00:08	0.46	0.82	0.40
C14	CONDUIT	35.44	0 00:08	4.02	0.26	0.35

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C2	1.00	0.01	0.00	0.00	0.23	0.76	0.00	0.00	3.50	0.0001
C4	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.09	0.0002
C5	1.00	0.01	0.00	0.00	0.88	0.11	0.00	0.00	0.47	0.0010

C7	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.11	0.0002
C8	1.00	0.01	0.00	0.00	0.75	0.24	0.00	0.00	0.51	0.0010
C9	1.00	0.01	0.00	0.00	0.01	0.98	0.00	0.00	4.41	0.0001
C10	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.21	0.0004
C12	1.00	0.01	0.00	0.00	0.95	0.04	0.00	0.00	0.42	0.0013
C13	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.22	0.0004
C14	1.00	0.01	0.00	0.00	0.01	0.98	0.00	0.00	4.33	0.0001

****

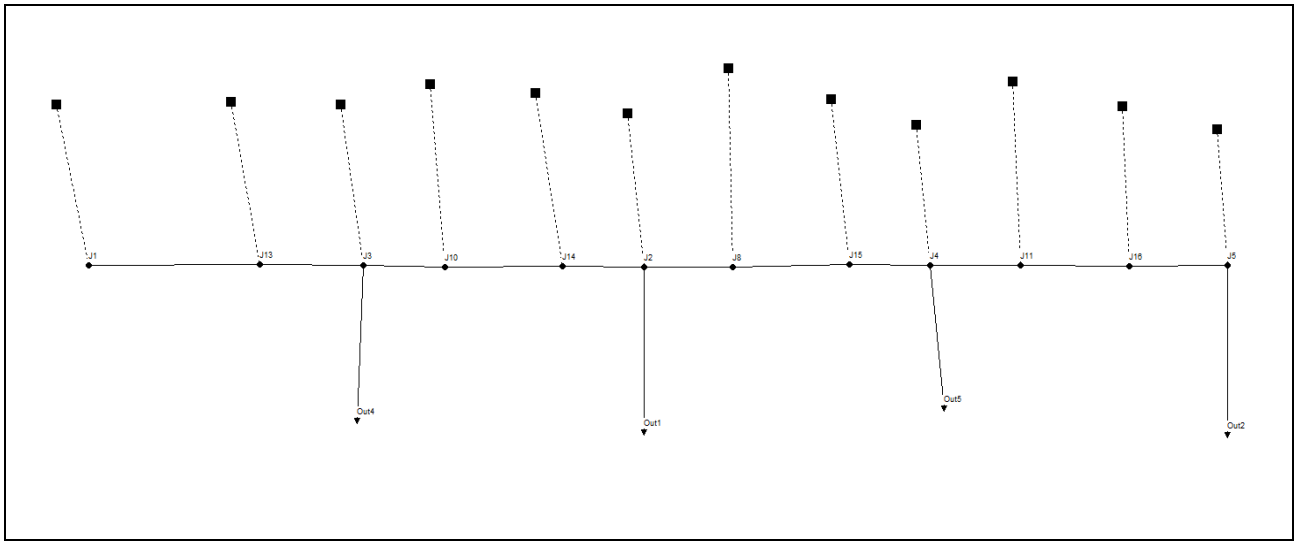
Conduit Surcharge Summary

****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C5	0.01	0.01	0.01	0.12	0.01
C8	0.01	0.01	0.01	0.12	0.01
C12	0.01	0.01	0.01	0.10	0.01

ALLEGATO 5: RISULTATI DIMENSIONAMENTO VIADOTTI E PONTI

VERIFICA INTERASSE SCARICHI – PONTE SUL TORRENTE CROSTOLO E VIADOTTO AD EST DEL TORRENTE CROSTOLO



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 05:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.002        35.500
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.002        34.552
Final Surface Storage ....         0.000         0.953
Continuity Error (%) .....         0.000
**************************       Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
```

```
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.002         0.018
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.002         0.018
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
**************************

Time-Step Critical Elements
**************************
None
********************************

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

Routing Time Step Summary
*************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
***************************

Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------------
                    Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip     Runon      Evap      Infil    Runoff    Runoff    Runoff   Coeff
Subcatchment            mm        mm        mm        mm        mm    10^6 ltr     LPS
-----------------------------------------------------------------------------------------------------
S1                 35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
S2                 35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
S3                 35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
S4                 35.50      0.00      0.00      0.00     34.55      0.00     2.62   0.973
S7                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
S8                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
S9                 35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
S10                35.50      0.00      0.00      0.00     34.55      0.00     4.37   0.973
S13                35.50      0.00      0.00      0.00     34.56      0.00     0.58   0.973
S14                35.50      0.00      0.00      0.00     34.56      0.00     0.58   0.973
S15                35.50      0.00      0.00      0.00     34.56      0.00     0.58   0.973
S16                35.50      0.00      0.00      0.00     34.56      0.00     0.58   0.973
******************

Node Depth Summary
******************
-------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J1          JUNCTION      0.00     0.07     0.23    0  00:06
J2          JUNCTION      0.00     0.02     0.11    0  00:06
J3          JUNCTION      0.00     0.02     0.16    0  00:06
J4          JUNCTION      0.00     0.02     0.07    0  00:06
J5          JUNCTION      0.00     0.02     0.02    0  00:06
J8          JUNCTION      0.00     0.06     0.14    0  00:06
J10         JUNCTION      0.00     0.06     0.18    0  00:06
J11         JUNCTION      0.00     0.06     0.09    0  00:06
J13         JUNCTION      0.00     0.09     0.23    0  00:06
J14         JUNCTION      0.00     0.08     0.18    0  00:06
J15         JUNCTION      0.00     0.08     0.14    0  00:06
J16         JUNCTION      0.00     0.08     0.09    0  00:06
Out1        OUTFALL       0.00     0.02    -0.98    0  00:06
Out2        OUTFALL       0.00     0.02    -0.98    0  00:06
Out4        OUTFALL       0.00     0.02    -0.98    0  00:06
Out5        OUTFALL       0.00     0.02    -0.98    0  00:06
*******************
```

Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J2	JUNCTION	0.58	7.59	0 00:06	0.000	0.005
J3	JUNCTION	0.58	8.64	0 00:06	0.000	0.005
J4	JUNCTION	0.58	7.58	0 00:06	0.000	0.005
J5	JUNCTION	0.58	6.52	0 00:06	0.000	0.004
J8	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J10	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J11	JUNCTION	2.62	2.62	0 00:06	0.002	0.002
J13	JUNCTION	4.37	7.00	0 00:06	0.003	0.004
J14	JUNCTION	4.37	5.95	0 00:06	0.003	0.004
J15	JUNCTION	4.37	5.94	0 00:06	0.003	0.004
J16	JUNCTION	4.37	5.94	0 00:06	0.003	0.004
Out1	OUTFALL	0.00	7.59	0 00:06	0.000	0.004
Out2	OUTFALL	0.00	6.52	0 00:06	0.000	0.004
Out4	OUTFALL	0.00	8.64	0 00:06	0.000	0.005
Out5	OUTFALL	0.00	7.58	0 00:06	0.000	0.004

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	8.99	2.77	7.59	0.004
Out2	9.53	2.24	6.52	0.004
Out4	8.53	3.32	8.64	0.005
Out5	9.06	2.75	7.58	0.004
System	9.03	11.08	30.33	0.018

****
Link Flow Summary
****

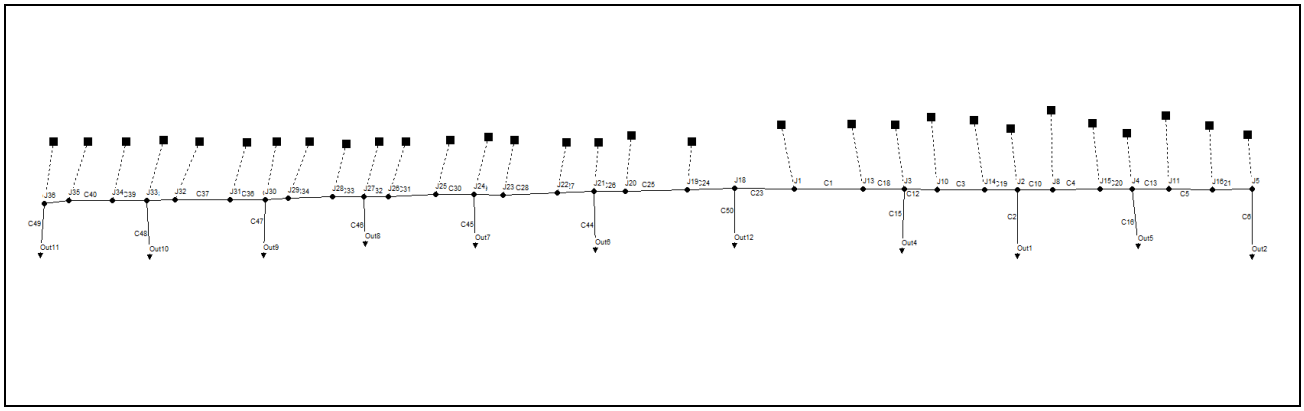
Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CHANNEL	2.62	0 00:06	0.24	0.20	0.76
C2	CONDUIT	7.59	0 00:06	4.33	0.04	0.14
C3	CHANNEL	1.57	0 00:06	0.23	0.12	0.72
C4	CHANNEL	1.57	0 00:06	0.23	0.12	0.72
C5	CHANNEL	1.57	0 00:06	0.23	0.12	0.72
C6	CONDUIT	6.52	0 00:06	4.01	0.04	0.14
C10	CHANNEL	1.06	0 00:06	0.36	0.08	0.42
C12	CHANNEL	1.05	0 00:06	0.35	0.08	0.43
C13	CHANNEL	1.06	0 00:06	0.35	0.08	0.42
C15	CONDUIT	8.64	0 00:06	4.56	0.05	0.15
C16	CONDUIT	7.58	0 00:06	4.26	0.04	0.14
C18	CHANNEL	7.00	0 00:06	1.59	0.53	0.55
C19	CHANNEL	5.95	0 00:06	1.47	0.45	0.52
C20	CHANNEL	5.94	0 00:06	1.46	0.45	0.53
C21	CHANNEL	5.94	0 00:06	1.50	0.45	0.52

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0000
C2	1.00	0.00	0.00	0.00	0.84	0.16	0.00	0.00	1.18	0.0000
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.18	0.0000
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.25	0.0000
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.28	0.0000
C6	1.00	0.00	0.00	0.00	0.75	0.25	0.00	0.00	1.59	0.0000
C10	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.24	0.0000
C12	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.17	0.0000
C13	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.31	0.0000
C15	1.00	0.00	0.00	0.00	0.86	0.13	0.00	0.00	1.09	0.0000
C16	1.00	0.00	0.00	0.00	0.84	0.15	0.00	0.00	1.15	0.0000
C18	1.00	0.00	0.00	0.00	0.89	0.11	0.00	0.00	0.32	0.0001
C19	1.00	0.00	0.00	0.00	0.88	0.11	0.00	0.00	0.39	0.0001
C20	1.00	0.00	0.00	0.00	0.88	0.11	0.00	0.00	0.45	0.0001
C21	1.00	0.00	0.00	0.00	0.89	0.10	0.00	0.00	0.46	0.0001

****
Conduit Surcharge Summary
****
No conduits were surcharged.

VERIFICA INTERASSE SCARICHI – VIADOTTO CASA GALLINARI



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 05:00:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec

**********	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
**********	---	---
Total Precipitation	0.005	35.500
Evaporation Loss	0.000	0.000
Infiltration Loss	0.000	0.000
Surface Runoff	0.005	34.553
Final Surface Storage	0.000	0.953
Continuity Error (%)	0.000	

**********	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
**********	---	---
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.005	0.052
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.005	0.052
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000

Initial Stored Volume 0.000 0.000
Final Stored Volume 0.000 0.000
Continuity Error (%) 0.000
****

Time-Step Critical Elements
****

Link C47 (1.10%)
****

Highest Flow Instability Indexes
****

Link C41 (5)
Link C32 (5)
Link C35 (5)
Link C38 (5)
Link C29 (5)
****

Routing Time Step Summary
****

Minimum Time Step : 0.50 sec
Average Time Step : 0.99 sec
Maximum Time Step : 1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S1	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973
S2	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973
S3	35.50	0.00	0.00	0.00	34.55	0.00	1.75	0.973
S4	35.50	0.00	0.00	0.00	34.55	0.00	1.75	0.973
S7	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S8	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S9	35.50	0.00	0.00	0.00	34.55	0.00	4.37	0.973
S10	35.50	0.00	0.00	0.00	34.55	0.00	4.37	0.973
S13	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S14	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S15	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S16	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S18	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S19	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S20	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973
S21	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S22	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S23	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973
S24	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S25	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S26	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973
S27	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S28	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S29	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973
S30	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S31	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S32	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973
S33	35.50	0.00	0.00	0.00	34.55	0.00	2.62	0.973
S34	35.50	0.00	0.00	0.00	34.55	0.00	4.38	0.973
S35	35.50	0.00	0.00	0.00	34.56	0.00	1.75	0.973

****

Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J1	JUNCTION	0.00	0.06	48.98	0 00:03
J2	JUNCTION	0.00	0.03	48.90	0 00:05
J3	JUNCTION	0.00	0.03	48.93	0 00:04
J4	JUNCTION	0.00	0.02	48.86	0 00:05

J5	JUNCTION	0.00	0.02	48.83	0	00:05
J8	JUNCTION	0.00	0.06	48.92	0	00:05
J10	JUNCTION	0.00	0.06	48.95	0	00:05
J11	JUNCTION	0.00	0.06	48.89	0	00:05
J13	JUNCTION	0.00	0.07	48.98	0	00:03
J14	JUNCTION	0.00	0.07	48.95	0	00:05
J15	JUNCTION	0.00	0.07	48.92	0	00:05
J16	JUNCTION	0.01	0.07	48.89	0	00:05
J18	JUNCTION	0.00	0.02	48.95	0	00:03
J19	JUNCTION	0.00	0.05	48.97	0	00:03
J20	JUNCTION	0.00	0.07	48.97	0	00:04
J21	JUNCTION	0.00	0.02	48.91	0	00:04
J22	JUNCTION	0.00	0.06	48.93	0	00:02
J23	JUNCTION	0.00	0.08	48.93	0	00:03
J24	JUNCTION	0.00	0.02	48.87	0	00:03
J25	JUNCTION	0.00	0.06	48.89	0	00:02
J26	JUNCTION	0.00	0.08	48.89	0	00:03
J27	JUNCTION	0.00	0.02	48.83	0	00:03
J28	JUNCTION	0.00	0.06	48.85	0	00:02
J29	JUNCTION	0.01	0.08	48.85	0	00:03
J30	JUNCTION	0.00	0.02	48.78	0	00:03
J31	JUNCTION	0.00	0.06	48.80	0	00:02
J32	JUNCTION	0.01	0.08	48.80	0	00:03
J33	JUNCTION	0.00	0.02	48.74	0	00:03
J34	JUNCTION	0.00	0.06	48.76	0	00:02
J35	JUNCTION	0.01	0.08	48.76	0	00:03
J36	JUNCTION	0.00	0.02	48.69	0	00:03
Out1	OUTFALL	0.00	0.03	47.87	0	00:05
Out2	OUTFALL	0.00	0.02	47.77	0	00:05
Out4	OUTFALL	0.00	0.03	47.91	0	00:04
Out5	OUTFALL	0.00	0.02	47.82	0	00:05
Out6	OUTFALL	0.00	0.02	47.89	0	00:04
Out7	OUTFALL	0.00	0.02	47.82	0	00:03
Out8	OUTFALL	0.00	0.02	47.76	0	00:03
Out9	OUTFALL	0.00	0.02	47.69	0	00:03
Out10	OUTFALL	0.00	0.02	47.63	0	00:03
Out11	OUTFALL	0.00	0.02	47.56	0	00:03
Out12	OUTFALL	0.00	0.02	47.95	0	00:03

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	1.75	2.22	0	00:02	0.001	0.001
J2	JUNCTION	2.62	9.06	0	00:05	0.002	0.005
J3	JUNCTION	2.62	9.05	0	00:03	0.002	0.005
J4	JUNCTION	2.62	9.07	0	00:05	0.002	0.005
J5	JUNCTION	2.62	7.20	0	00:05	0.002	0.004
J8	JUNCTION	1.75	1.98	0	00:02	0.001	0.001
J10	JUNCTION	1.75	2.20	0	00:02	0.001	0.001
J11	JUNCTION	1.75	2.00	0	00:02	0.001	0.001
J13	JUNCTION	4.38	4.38	0	00:06	0.003	0.003
J14	JUNCTION	4.38	4.38	0	00:06	0.003	0.003
J15	JUNCTION	4.37	4.37	0	00:06	0.003	0.003
J16	JUNCTION	4.37	4.37	0	00:06	0.003	0.003
J18	JUNCTION	0.00	3.36	0	00:03	0.000	0.002
J19	JUNCTION	1.75	2.07	0	00:02	0.001	0.001
J20	JUNCTION	4.38	4.68	0	00:03	0.003	0.003
J21	JUNCTION	2.62	9.17	0	00:04	0.002	0.005
J22	JUNCTION	1.75	1.96	0	00:02	0.001	0.001
J23	JUNCTION	4.38	4.87	0	00:02	0.003	0.003
J24	JUNCTION	2.62	9.22	0	00:03	0.002	0.005
J25	JUNCTION	1.75	1.96	0	00:02	0.001	0.001
J26	JUNCTION	4.38	4.87	0	00:02	0.003	0.003
J27	JUNCTION	2.62	9.22	0	00:03	0.002	0.005
J28	JUNCTION	1.75	1.96	0	00:02	0.001	0.001
J29	JUNCTION	4.38	4.87	0	00:02	0.003	0.003
J30	JUNCTION	2.62	9.21	0	00:03	0.002	0.005
J31	JUNCTION	1.75	1.96	0	00:02	0.001	0.001

J32	JUNCTION	4.38	4.86	0	00:02	0.003	0.003
J33	JUNCTION	2.62	9.21	0	00:03	0.002	0.005
J34	JUNCTION	1.75	1.96	0	00:02	0.001	0.001
J35	JUNCTION	4.38	4.86	0	00:02	0.003	0.003
J36	JUNCTION	2.62	7.71	0	00:03	0.002	0.004
Out1	OUTFALL	0.00	8.95	0	00:05	0.000	0.005
Out2	OUTFALL	0.00	7.04	0	00:05	0.000	0.004
Out4	OUTFALL	0.00	8.99	0	00:04	0.000	0.005
Out5	OUTFALL	0.00	8.97	0	00:05	0.000	0.005
Out6	OUTFALL	0.00	8.85	0	00:04	0.000	0.005
Out7	OUTFALL	0.00	8.89	0	00:03	0.000	0.005
Out8	OUTFALL	0.00	8.89	0	00:03	0.000	0.005
Out9	OUTFALL	0.00	8.89	0	00:03	0.000	0.005
Out10	OUTFALL	0.00	8.89	0	00:03	0.000	0.005
Out11	OUTFALL	0.00	7.39	0	00:03	0.000	0.004
Out12	OUTFALL	0.00	3.36	0	00:03	0.000	0.002

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	9.57	3.94	8.95	0.005
Out2	10.48	2.82	7.04	0.004
Out4	9.20	4.12	8.99	0.005
Out5	10.02	3.76	8.97	0.005
Out6	9.24	4.02	8.85	0.005
Out7	9.67	3.91	8.89	0.005
Out8	9.74	3.88	8.89	0.005
Out9	9.74	3.88	8.89	0.005
Out10	9.74	3.88	8.89	0.005
Out11	10.18	3.15	7.39	0.004
Out12	6.68	2.14	3.36	0.002
System	9.48	39.50	88.39	0.052

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CHANNEL	0.52	0 00:02	0.17	0.05	0.65
C2	CONDUIT	8.95	0 00:05	4.45	0.05	0.16
C3	CHANNEL	0.50	0 00:02	0.18	0.05	0.65
C4	CHANNEL	0.41	0 00:02	0.18	0.04	0.65
C5	CHANNEL	0.43	0 00:02	0.18	0.04	0.65
C6	CONDUIT	7.04	0 00:05	4.19	0.04	0.14
C10	CHANNEL	1.92	0 00:05	0.67	0.18	0.41
C12	CHANNEL	1.92	0 00:05	0.67	0.18	0.41
C13	CHANNEL	1.93	0 00:05	0.67	0.18	0.41
C15	CONDUIT	8.99	0 00:04	4.43	0.05	0.16
C16	CONDUIT	8.97	0 00:05	4.48	0.05	0.16
C18	CHANNEL	4.54	0 00:03	1.25	0.42	0.49
C19	CHANNEL	4.52	0 00:05	1.25	0.42	0.49
C20	CHANNEL	4.52	0 00:05	1.25	0.42	0.49
C21	CHANNEL	4.58	0 00:05	1.31	0.42	0.47
C23	CHANNEL	1.83	0 00:03	0.73	0.17	0.37
C24	CHANNEL	1.52	0 00:03	0.65	0.11	0.35
C25	CHANNEL	0.47	0 00:16	0.22	0.04	0.64
C26	CHANNEL	5.01	0 00:04	1.35	0.39	0.50
C27	CHANNEL	1.59	0 00:02	0.58	0.12	0.40

C28	CHANNEL	0.54	0	00:02	0.22	0.04	0.65
C29	CHANNEL	5.14	0	00:03	1.37	0.40	0.50
C30	CHANNEL	1.58	0	00:02	0.58	0.12	0.40
C31	CHANNEL	0.54	0	00:02	0.22	0.04	0.65
C32	CHANNEL	5.14	0	00:03	1.37	0.40	0.50
C33	CHANNEL	1.59	0	00:02	0.58	0.12	0.40
C34	CHANNEL	0.53	0	00:02	0.22	0.04	0.65
C35	CHANNEL	5.14	0	00:03	1.37	0.40	0.50
C36	CHANNEL	1.59	0	00:02	0.58	0.12	0.39
C37	CHANNEL	0.53	0	00:02	0.22	0.04	0.65
C38	CHANNEL	5.14	0	00:03	1.38	0.39	0.50
C39	CHANNEL	1.59	0	00:02	0.58	0.12	0.39
C40	CHANNEL	0.52	0	00:02	0.22	0.04	0.65
C41	CHANNEL	5.14	0	00:03	1.42	0.40	0.49
C44	CONDUIT	8.85	0	00:04	4.42	0.05	0.16
C45	CONDUIT	8.89	0	00:03	4.46	0.05	0.16
C46	CONDUIT	8.89	0	00:03	4.50	0.05	0.15
C47	CONDUIT	8.89	0	00:03	4.53	0.05	0.15
C48	CONDUIT	8.89	0	00:03	4.56	0.05	0.15
C49	CONDUIT	7.39	0	00:03	4.35	0.04	0.14
C50	CONDUIT	3.36	0	00:03	3.22	0.02	0.10

****

Flow Classification Summary

****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000
C2	1.00	0.00	0.00	0.00	0.83	0.17	0.00	0.00	1.27	0.0000
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.13	0.0000
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.19	0.0000
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.24	0.0000
C6	1.00	0.00	0.00	0.00	0.73	0.26	0.00	0.00	1.75	0.0000
C10	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.24	0.0000
C12	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.18	0.0000
C13	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.30	0.0000
C15	1.00	0.00	0.00	0.00	0.85	0.15	0.00	0.00	1.18	0.0000
C16	1.00	0.00	0.00	0.00	0.82	0.18	0.00	0.00	1.36	0.0000
C18	1.00	0.00	0.00	0.00	0.91	0.08	0.00	0.00	0.25	0.0016
C19	1.00	0.00	0.00	0.00	0.91	0.09	0.00	0.00	0.32	0.0017
C20	1.00	0.00	0.00	0.00	0.91	0.09	0.00	0.00	0.39	0.0017
C21	1.00	0.00	0.00	0.00	0.91	0.09	0.00	0.00	0.42	0.0018
C23	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.08	0.0000
C24	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.07	0.0000
C25	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000
C26	1.00	0.00	0.00	0.00	0.90	0.09	0.00	0.00	0.27	0.0018
C27	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.18	0.0000
C28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.15	0.0000
C29	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.35	0.0018
C30	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.25	0.0000
C31	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.21	0.0000
C32	1.00	0.00	0.00	0.00	0.89	0.10	0.00	0.00	0.42	0.0019
C33	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.31	0.0000
C34	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.27	0.0000
C35	1.00	0.00	0.00	0.00	0.89	0.10	0.00	0.00	0.47	0.0019
C36	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.35	0.0000
C37	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.32	0.0000
C38	1.00	0.00	0.00	0.00	0.89	0.10	0.00	0.00	0.52	0.0019
C39	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.00	0.41	0.0000
C40	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.35	0.0000
C41	1.00	0.00	0.00	0.00	0.90	0.10	0.00	0.00	0.53	0.0019
C44	1.00	0.00	0.00	0.00	0.86	0.14	0.00	0.00	1.12	0.0000
C45	1.00	0.00	0.00	0.00	0.84	0.15	0.00	0.00	1.22	0.0000
C46	1.00	0.00	0.00	0.00	0.84	0.16	0.00	0.00	1.24	0.0000
C47	1.00	0.00	0.00	0.00	0.84	0.16	0.00	0.00	1.26	0.0000
C48	1.00	0.00	0.00	0.00	0.84	0.16	0.00	0.00	1.26	0.0000
C49	1.00	0.00	0.00	0.00	0.71	0.28	0.00	0.00	1.89	0.0000
C50	1.00	0.01	0.00	0.00	0.92	0.07	0.00	0.00	0.67	0.0000

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Conduit Surcharge Summary

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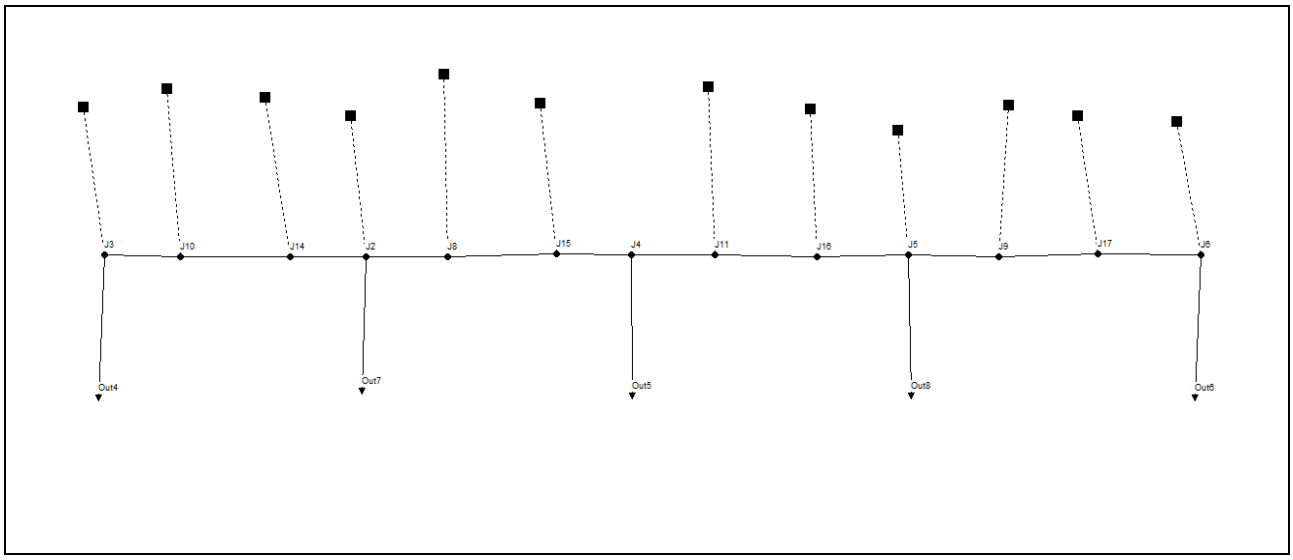
No conduits were surcharged.

VERIFICA INTERASSE SCARICHI – PONTE SUL TORRENTE MODOLENA



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 05:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.001        35.500
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.001        34.552
Final Surface Storage ....         0.000         0.953
Continuity Error (%) .....         0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.001         0.011
Groundwater Inflow .......         0.000         0.000
```

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RDII Inflow ..............      0.000      0.000
External Inflow ..........      0.000      0.000
External Outflow .........      0.001      0.011
Internal Outflow .........      0.000      0.000
Storage Losses ...........      0.000      0.000
Initial Stored Volume ....      0.000      0.000
Final Stored Volume ......      0.000      0.000
Continuity Error (%) .....      0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
Link C12 (1)
Link C15 (1)
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
****************************
Subcatchment Runoff Summary
****************************
-----------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment         mm        mm        mm        mm        mm    10^6 ltr    LPS
-----------------------------------------------------------------------------------------------------
S2                35.50      0.00      0.00      0.00     34.55      0.00      2.33   0.973
S3                35.50      0.00      0.00      0.00     34.55      0.00      2.33   0.973
S4                35.50      0.00      0.00      0.00     34.55      0.00      1.40   0.973
S5                35.50      0.00      0.00      0.00     34.55      0.00      1.40   0.973
S8                35.50      0.00      0.00      0.00     34.55      0.00      1.40   0.973
S9                35.50      0.00      0.00      0.00     34.55      0.00      1.40   0.973
S10               35.50      0.00      0.00      0.00     34.55      0.00      2.33   0.973
S11               35.50      0.00      0.00      0.00     34.55      0.00      2.33   0.973
S13               35.50      0.00      0.00      0.00     34.55      0.00      0.93   0.973
S14               35.50      0.00      0.00      0.00     34.55      0.00      0.93   0.973
S16               35.50      0.00      0.00      0.00     34.55      0.00      0.93   0.973
S17               35.50      0.00      0.00      0.00     34.55      0.00      0.93   0.973
******************
Node Depth Summary
******************
-------------------------------------------------------------------
                       Average  Maximum  Maximum  Time of Max
                         Depth    Depth      HGL   Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J2          JUNCTION      0.00     0.02     0.02    0  00:05
J3          JUNCTION      0.00     0.02     0.02    0  00:05
J4          JUNCTION      0.00     0.02     0.02    0  00:03
J5          JUNCTION      0.00     0.02     0.02    0  00:06
J6          JUNCTION      0.00     0.01     0.02    0  00:06
J8          JUNCTION      0.00     0.06     0.07    0  00:05
J9          JUNCTION      0.00     0.06     0.06    0  00:06
J10         JUNCTION      0.00     0.06     0.06    0  00:05
J11         JUNCTION      0.00     0.06     0.06    0  00:06
J14         JUNCTION      0.00     0.06     0.06    0  00:05
J15         JUNCTION      0.00     0.06     0.06    0  00:04
J16         JUNCTION      0.00     0.06     0.06    0  00:06
J17         JUNCTION      0.00     0.06     0.06    0  00:06
Out4        OUTFALL       0.00     0.02    -0.98    0  00:05
Out5        OUTFALL       0.00     0.02    -0.98    0  00:03
Out6        OUTFALL       0.00     0.01    -0.99    0  00:06
Out7        OUTFALL       0.00     0.02    -0.98    0  00:05
Out8        OUTFALL       0.00     0.02    -0.98    0  00:03
*******************
Node Inflow Summary
```

****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	0.93	5.72	0 00:05	0.001	0.003
J3	JUNCTION	0.93	3.95	0 00:05	0.001	0.002
J4	JUNCTION	0.00	3.58	0 00:03	0.000	0.002
J5	JUNCTION	0.93	4.68	0 00:06	0.001	0.003
J6	JUNCTION	0.93	2.87	0 00:06	0.001	0.002
J8	JUNCTION	2.33	2.51	0 00:03	0.001	0.001
J9	JUNCTION	1.40	1.98	0 00:03	0.001	0.001
J10	JUNCTION	2.33	2.51	0 00:02	0.001	0.001
J11	JUNCTION	1.40	1.97	0 00:03	0.001	0.001
J14	JUNCTION	1.40	2.16	0 00:03	0.001	0.001
J15	JUNCTION	1.40	2.13	0 00:03	0.001	0.001
J16	JUNCTION	2.33	2.33	0 00:06	0.001	0.001
J17	JUNCTION	2.33	2.33	0 00:06	0.001	0.001
Out4	OUTFALL	0.00	3.33	0 00:05	0.000	0.002
Out5	OUTFALL	0.00	3.58	0 00:03	0.000	0.002
Out6	OUTFALL	0.00	2.87	0 00:06	0.000	0.002
Out7	OUTFALL	0.00	5.31	0 00:05	0.000	0.003
Out8	OUTFALL	0.00	4.68	0 00:06	0.000	0.003

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out4	7.69	1.34	3.33	0.002
Out5	8.22	1.36	3.58	0.002
Out6	7.48	1.18	2.87	0.002
Out7	8.58	1.79	5.31	0.003
Out8	8.79	1.74	4.68	0.003
System	8.15	7.41	19.34	0.011

****
Link Flow Summary
****

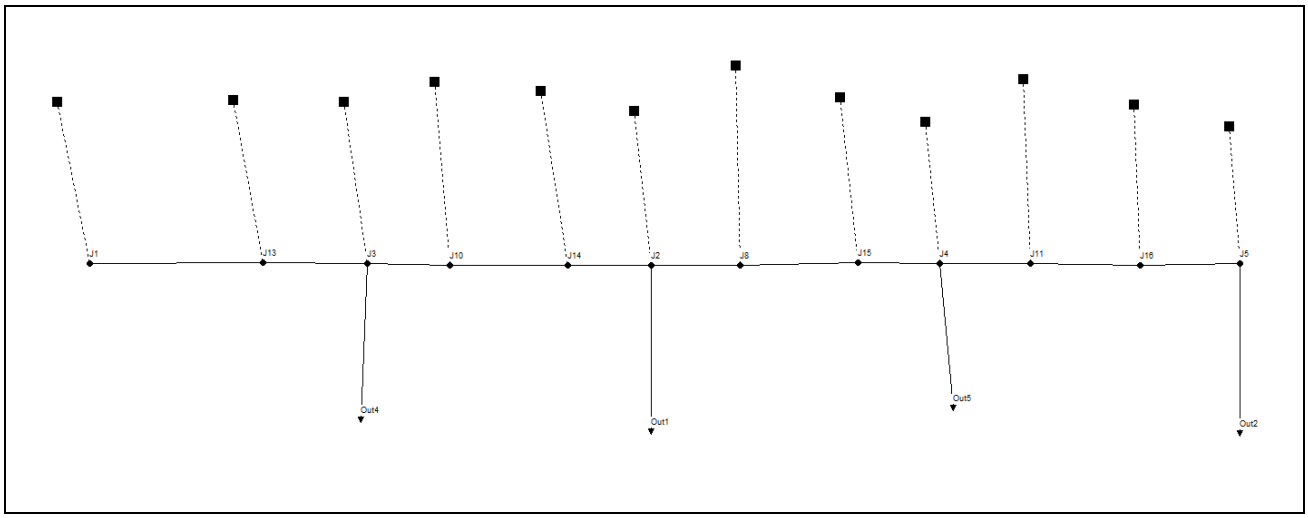
Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C3	CHANNEL	0.76	0 00:03	0.15	0.13	0.62
C4	CHANNEL	0.73	0 00:03	0.15	0.12	0.62
C5	CHANNEL	0.61	0 00:02	0.20	0.10	0.56
C7	CHANNEL	0.60	0 00:03	0.19	0.10	0.57
C10	CHANNEL	2.92	0 00:05	1.01	0.50	0.41
C11	CHANNEL	1.90	0 00:03	0.85	0.32	0.38
C12	CHANNEL	3.02	0 00:05	1.11	0.51	0.39
C13	CHANNEL	1.93	0 00:03	0.89	0.33	0.36
C15	CONDUIT	3.33	0 00:05	3.29	0.02	0.10
C16	CONDUIT	3.58	0 00:03	3.27	0.02	0.10
C17	CONDUIT	2.87	0 00:06	3.11	0.02	0.09
C19	CHANNEL	1.88	0 00:05	0.68	0.32	0.40
C20	CHANNEL	1.81	0 00:04	0.68	0.31	0.38
C21	CHANNEL	1.96	0 00:06	0.76	0.33	0.37
C22	CHANNEL	1.94	0 00:06	0.80	0.33	0.36
C23	CONDUIT	5.31	0 00:05	3.80	0.03	0.12
C24	CONDUIT	4.68	0 00:06	3.64	0.03	0.11

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0000
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0000
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.09	0.0000
C7	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.07	0.0000
C10	1.00	0.00	0.00	0.00	0.95	0.05	0.00	0.00	0.23	0.0021
C11	1.00	0.00	0.00	0.00	0.94	0.05	0.00	0.00	0.20	0.0000
C12	1.00	0.00	0.00	0.00	0.94	0.05	0.00	0.00	0.25	0.0027
C13	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.22	0.0000
C15	1.00	0.00	0.00	0.00	0.79	0.21	0.00	0.00	1.32	0.0000
C16	1.00	0.01	0.00	0.00	0.82	0.17	0.00	0.00	1.16	0.0000
C17	1.00	0.00	0.00	0.00	0.87	0.12	0.00	0.00	0.92	0.0000
C19	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.00	0.16	0.0000
C20	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.00	0.16	0.0000
C21	1.00	0.00	0.00	0.00	0.95	0.05	0.00	0.00	0.17	0.0000
C22	1.00	0.00	0.00	0.00	0.95	0.05	0.00	0.00	0.14	0.0000
C23	1.00	0.00	0.00	0.00	0.82	0.18	0.00	0.00	1.21	0.0000
C24	1.00	0.00	0.00	0.00	0.82	0.18	0.00	0.00	1.23	0.0000

****
Conduit Surcharge Summary
****
No conduits were surcharged.

VERIFICA INTERASSE SCARICHI – PONTE SUL TORRENTE QUARESIMO



- Durata 15' – T_R25anni (picco di 17.5mm in 5')

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 05:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.002        35.500
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.002        34.550
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....        0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.002         0.021
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
```

```
External Outflow .........      0.002      0.021
Internal Outflow .........     0.000      0.000
Storage Losses ...........      0.000      0.000
Initial Stored Volume ....      0.000      0.000
Final Stored Volume ......      0.000      0.000
Continuity Error (%) .....      0.000
**************************
Time-Step Critical Elements
**************************
Link C15 (2.02%)
********************************
Highest Flow Instability Indexes
********************************
Link C18 (7)
Link C15 (7)
Link C19 (5)
Link C20 (5)
Link C21 (5)
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     0.50 sec
Average Time Step          :     0.99 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
****************************
Subcatchment Runoff Summary
****************************
-----------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment        mm        mm        mm        mm        mm      10^6 ltr   LPS
-----------------------------------------------------------------------------------------------------
S1                35.50      0.00      0.00      0.00     34.55      0.00      2.25   0.973
S2                35.50      0.00      0.00      0.00     34.55      0.00      2.25   0.973
S3                35.50      0.00      0.00      0.00     34.55      0.00      2.25   0.973
S4                35.50      0.00      0.00      0.00     34.55      0.00      2.25   0.973
S7                35.50      0.00      0.00      0.00     34.55      0.00      3.75   0.973
S8                35.50      0.00      0.00      0.00     34.55      0.00      3.75   0.973
S9                35.50      0.00      0.00      0.00     34.55      0.00      3.75   0.973
S10               35.50      0.00      0.00      0.00     34.55      0.00      3.75   0.973
S13               35.50      0.00      0.00      0.00     34.55      0.00      1.50   0.973
S14               35.50      0.00      0.00      0.00     34.55      0.00      1.50   0.973
S15               35.50      0.00      0.00      0.00     34.55      0.00      1.50   0.973
S16               35.50      0.00      0.00      0.00     34.55      0.00      1.50   0.973
******************
Node Depth Summary
******************
-------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
Node          Type        Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J1          JUNCTION      0.01     0.08     0.12     0  00:06
J2          JUNCTION      0.00     0.02     0.04     0  00:05
J3          JUNCTION      0.00     0.03     0.06     0  00:06
J4          JUNCTION      0.00     0.02     0.03     0  00:05
J5          JUNCTION      0.00     0.02     0.02     0  00:05
J8          JUNCTION      0.00     0.07     0.09     0  00:05
J10         JUNCTION      0.00     0.07     0.10     0  00:06
J11         JUNCTION      0.01     0.07     0.08     0  00:06
J13         JUNCTION      0.01     0.09     0.12     0  00:05
J14         JUNCTION      0.01     0.07     0.10     0  00:05
J15         JUNCTION      0.01     0.07     0.09     0  00:05
J16         JUNCTION      0.01     0.07     0.08     0  00:05
Out1        OUTFALL       0.00     0.02    -0.98     0  00:05
Out2        OUTFALL       0.00     0.02    -0.98     0  00:06
Out4        OUTFALL       0.00     0.03    -0.97     0  00:06
Out5        OUTFALL       0.00     0.02    -0.98     0  00:05
*******************
Node Inflow Summary
*******************
```

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J1	JUNCTION	2.25	2.25	0 00:06	0.002	0.002
J2	JUNCTION	1.50	8.75	0 00:05	0.001	0.005
J3	JUNCTION	1.50	12.04	0 00:06	0.001	0.007
J4	JUNCTION	1.50	8.77	0 00:05	0.001	0.005
J5	JUNCTION	1.50	6.36	0 00:05	0.001	0.003
J8	JUNCTION	2.25	2.71	0 00:03	0.002	0.002
J10	JUNCTION	2.25	2.72	0 00:03	0.002	0.002
J11	JUNCTION	2.25	2.69	0 00:03	0.002	0.002
J13	JUNCTION	3.75	6.00	0 00:05	0.003	0.004
J14	JUNCTION	3.75	3.75	0 00:06	0.003	0.003
J15	JUNCTION	3.75	3.75	0 00:06	0.003	0.003
J16	JUNCTION	3.75	3.75	0 00:06	0.003	0.003
Out1	OUTFALL	0.00	7.63	0 00:05	0.000	0.005
Out2	OUTFALL	0.00	5.21	0 00:06	0.000	0.003
Out4	OUTFALL	0.00	10.18	0 00:06	0.000	0.007
Out5	OUTFALL	0.00	7.64	0 00:05	0.000	0.005

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	10.73	3.31	7.63	0.005
Out2	11.00	2.16	5.21	0.003
Out4	10.92	4.39	10.18	0.007
Out5	10.68	3.33	7.64	0.005
System	10.83	13.20	30.62	0.021

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CHANNEL	2.25	0 00:05	0.21	0.36	0.85
C2	CONDUIT	7.63	0 00:05	4.23	0.05	0.15
C3	CHANNEL	0.61	0 00:03	0.14	0.10	0.72
C4	CHANNEL	0.61	0 00:03	0.14	0.10	0.72
C5	CHANNEL	0.60	0 00:03	0.13	0.10	0.72
C6	CONDUIT	5.21	0 00:06	3.76	0.03	0.12
C10	CHANNEL	2.47	0 00:05	0.73	0.39	0.46
C12	CHANNEL	2.50	0 00:06	0.71	0.40	0.48
C13	CHANNEL	2.44	0 00:05	0.73	0.39	0.46
C15	CONDUIT	10.18	0 00:06	4.62	0.06	0.17
C16	CONDUIT	7.64	0 00:05	4.22	0.05	0.15
C18	CHANNEL	8.03	0 00:06	1.70	1.29	0.57
C19	CHANNEL	4.78	0 00:05	1.32	0.77	0.49
C20	CHANNEL	4.83	0 00:05	1.33	0.77	0.49
C21	CHANNEL	4.86	0 00:05	1.42	0.78	0.47

****
Flow Classification Summary
****

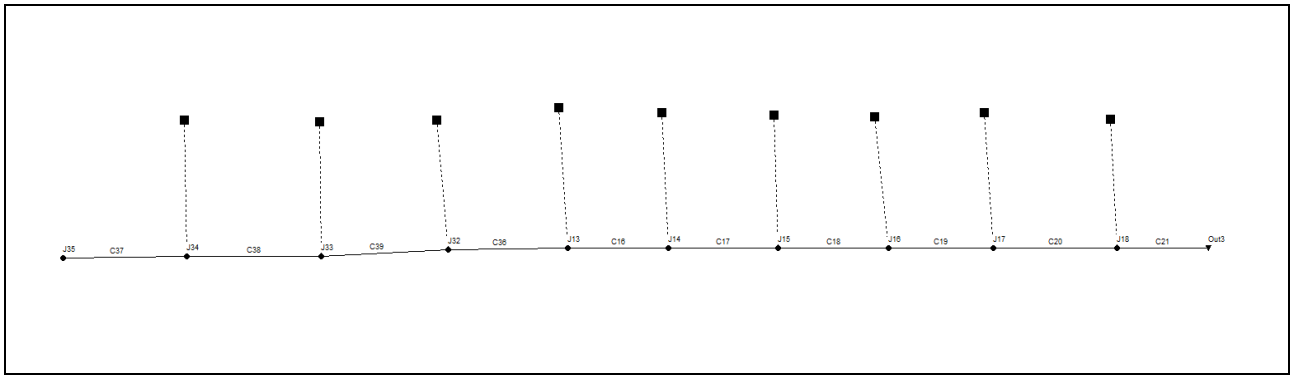
Adjusted /Actual	--- Fraction of Time in Flow Class ---- Up	Down	Sub	Sup	Up	Down	Avg. Froude	Avg. Flow

Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Number	Change
C1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0001
C2	1.00	0.00	0.00	0.00	0.77	0.23	0.00	0.00	1.60	0.0000
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.15	0.0000
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.18	0.0000
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.18	0.0000
C6	1.00	0.00	0.00	0.00	0.69	0.30	0.00	0.00	1.92	0.0000
C10	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.25	0.0000
C12	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.19	0.0000
C13	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.27	0.0000
C15	1.00	0.00	0.00	0.00	0.79	0.20	0.00	0.00	1.51	0.0000
C16	1.00	0.00	0.00	0.00	0.77	0.22	0.00	0.00	1.57	0.0000
C18	1.00	0.00	0.00	0.00	0.91	0.08	0.00	0.00	0.32	0.0233
C19	1.00	0.00	0.00	0.00	0.93	0.06	0.00	0.00	0.34	0.0110
C20	1.00	0.00	0.00	0.00	0.93	0.06	0.00	0.00	0.36	0.0111
C21	1.00	0.00	0.00	0.00	0.93	0.07	0.00	0.00	0.38	0.0115

****
Conduit Surcharge Summary
****

Conduit	Hours Both Ends Full	Hours Upstream Full	Hours Dnstream Full	Hours Above Full Normal Flow	Capacity Limited
C18	0.01	0.01	0.01	0.03	0.01

VERIFICA COLLETTORI – PONTE SUL TORRENTE CROSTOLO



- Durata 15' – T_R25anni

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.004        35.438
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.004        34.532
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....       -0.133
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.004         0.042
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.004         0.042
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
**************************
```

Time-Step Critical Elements
****
None
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 1.00 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 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 10^6 ltr	Peak Runoff CMS	Runoff Coeff
S11	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974
S12	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974
S13	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974
S14	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974
S15	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974
S16	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974
S29	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974
S30	35.44	0.00	0.00	0.00	34.53	0.01	0.01	0.974
S31	35.44	0.00	0.00	0.00	34.53	0.00	0.01	0.974

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J13	JUNCTION	0.00	0.16	0.43	0 00:08
J14	JUNCTION	0.00	0.18	0.41	0 00:08
J15	JUNCTION	0.00	0.20	0.38	0 00:08
J16	JUNCTION	0.00	0.21	0.35	0 00:08
J17	JUNCTION	0.00	0.22	0.31	0 00:09
J18	JUNCTION	0.00	0.23	0.27	0 00:09
J32	JUNCTION	0.00	0.14	0.46	0 00:08
J33	JUNCTION	0.00	0.12	0.48	0 00:08
J34	JUNCTION	0.00	0.09	0.49	0 00:08
J35	JUNCTION	0.00	0.03	0.49	0 00:08
Out3	OUTFALL	0.00	0.22	0.22	0 00:09

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J13	JUNCTION	0.010	0.043	0 00:08	0.004	0.020
J14	JUNCTION	0.010	0.053	0 00:08	0.004	0.024
J15	JUNCTION	0.010	0.062	0 00:08	0.004	0.029
J16	JUNCTION	0.010	0.071	0 00:08	0.004	0.033
J17	JUNCTION	0.010	0.080	0 00:09	0.004	0.038
J18	JUNCTION	0.010	0.089	0 00:09	0.004	0.042
J32	JUNCTION	0.010	0.034	0 00:08	0.004	0.015
J33	JUNCTION	0.010	0.024	0 00:08	0.004	0.011
J34	JUNCTION	0.014	0.014	0 00:08	0.006	0.006
J35	JUNCTION	0.000	0.001	0 00:08	0.000	0.000
Out3	OUTFALL	0.000	0.089	0 00:09	0.000	0.042

****
Node Surcharge Summary

****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out3	3.78	0.013	0.089	0.042
System	3.78	0.013	0.089	0.042

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	0.043	0 00:08	0.86	0.34	0.45
C17	CONDUIT	0.052	0 00:08	0.93	0.41	0.50
C18	CONDUIT	0.061	0 00:08	0.99	0.48	0.54
C19	CONDUIT	0.071	0 00:08	1.06	0.56	0.57
C20	CONDUIT	0.080	0 00:09	1.15	0.63	0.59
C21	CONDUIT	0.089	0 00:09	1.30	0.70	0.58
C36	CONDUIT	0.033	0 00:08	0.79	0.26	0.40
C37	CONDUIT	0.001	0 00:09	0.06	0.00	0.15
C38	CONDUIT	0.014	0 00:08	0.57	0.11	0.27
C39	CONDUIT	0.023	0 00:08	0.69	0.18	0.34

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.05	0.0000
C17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.05	0.0000
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.05	0.0000
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
C20	1.00	0.00	0.14	0.00	0.85	0.00	0.00	0.05	0.0000
C21	1.00	0.00	0.00	0.00	0.98	0.02	0.00	0.08	0.0000
C36	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000
C37	1.00	0.00	0.96	0.00	0.04	0.00	0.00	0.00	0.0000
C38	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C39	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000

****
Conduit Surcharge Summary
****
No conduits were surcharged.

- Durata 15' – T_R100anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****

```
  Flow Units ............... CMS
  Process Models:
    Rainfall/Runoff ........ YES
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ YES
    Water Quality .......... NO
  Infiltration Method ...... CURVE_NUMBER
  Flow Routing Method ...... DYNWAVE
  Starting Date ............ FEB-14-2012 00:00:00
  Ending Date .............. FEB-14-2012 23:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:00:30
  Wet Time Step ............ 00:00:05
  Dry Time Step ............ 00:00:30
  Routing Time Step ........ 1.00 sec
  ************************          Volume         Depth
  Runoff Quantity Continuity     hectare-m           mm
  ************************     ---------       -------
  Total Precipitation ......         0.006        46.400
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.000         0.000
  Surface Runoff ...........         0.006        45.515
  Final Surface Storage ....         0.000         0.953
  Continuity Error (%) .....        -0.146
  ************************          Volume       Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  ************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.006         0.056
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         0.000         0.000
  External Outflow .........         0.006         0.056
  Internal Outflow .........         0.000         0.000
  Storage Losses ...........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.000         0.000
  Continuity Error (%) .....         0.000
  ************************
  Time-Step Critical Elements
  ***************************
  None
  *******************************
  Highest Flow Instability Indexes
  ********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step          :     1.00 sec
  Average Time Step          :     1.00 sec
  Maximum Time Step          :     1.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ****************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------
                     Total     Total     Total     Total     Total     Total    Peak  Runoff
                    Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
  Subcatchment          mm        mm        mm        mm        mm    10^6 ltr     CMS
  ---------------------------------------------------------------------------------------------
  S11                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
  S12                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
  S13                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
  S14                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
  S15                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
  S16                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
  S29                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
  S30                 46.40      0.00      0.00      0.00     45.52      0.01     0.02   0.981
  S31                 46.40      0.00      0.00      0.00     45.52      0.01     0.01   0.981
```

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J13	JUNCTION	0.00	0.19	0.46	0 00:08
J14	JUNCTION	0.00	0.22	0.44	0 00:08
J15	JUNCTION	0.00	0.24	0.42	0 00:08
J16	JUNCTION	0.00	0.25	0.39	0 00:08
J17	JUNCTION	0.00	0.26	0.35	0 00:08
J18	JUNCTION	0.00	0.26	0.31	0 00:09
J32	JUNCTION	0.00	0.17	0.48	0 00:08
J33	JUNCTION	0.00	0.14	0.50	0 00:08
J34	JUNCTION	0.00	0.10	0.51	0 00:08
J35	JUNCTION	0.00	0.05	0.51	0 00:08
Out3	OUTFALL	0.00	0.25	0.25	0 00:09

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J13	JUNCTION	0.013	0.057	0 00:08	0.006	0.026
J14	JUNCTION	0.013	0.069	0 00:08	0.006	0.032
J15	JUNCTION	0.013	0.081	0 00:08	0.006	0.038
J16	JUNCTION	0.013	0.093	0 00:08	0.006	0.044
J17	JUNCTION	0.013	0.105	0 00:08	0.006	0.050
J18	JUNCTION	0.013	0.117	0 00:09	0.006	0.056
J32	JUNCTION	0.013	0.044	0 00:08	0.006	0.020
J33	JUNCTION	0.013	0.031	0 00:08	0.006	0.014
J34	JUNCTION	0.019	0.019	0 00:08	0.008	0.008
J35	JUNCTION	0.000	0.001	0 00:08	0.000	0.000
Out3	OUTFALL	0.000	0.117	0 00:09	0.000	0.056

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out3	3.81	0.018	0.117	0.056
System	3.81	0.018	0.117	0.056

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	0.056	0 00:08	0.89	0.44	0.54
C17	CONDUIT	0.068	0 00:08	0.96	0.54	0.60
C18	CONDUIT	0.080	0 00:08	1.04	0.63	0.65
C19	CONDUIT	0.092	0 00:08	1.13	0.73	0.68
C20	CONDUIT	0.104	0 00:08	1.24	0.82	0.69
C21	CONDUIT	0.117	0 00:09	1.43	0.92	0.68
C36	CONDUIT	0.043	0 00:08	0.82	0.34	0.48

```
C37              CONDUIT     0.001     0  00:10     0.10    0.01    0.19
C38              CONDUIT     0.018     0  00:09     0.59    0.14    0.32
C39              CONDUIT     0.031     0  00:08     0.72    0.24    0.40
****************************
Flow Classification Summary
***************************
-------------------------------------------------------------------------------------
                Adjusted    --- Fraction of Time in Flow Class ----   Avg.     Avg.
                 /Actual       Up   Down  Sub   Sup   Up    Down   Froude   Flow
Conduit           Length     Dry  Dry   Dry   Crit  Crit  Crit  Crit   Number   Change
-------------------------------------------------------------------------------------
C16               1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.05   0.0000
C17               1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.05   0.0000
C18               1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.05   0.0000
C19               1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.06   0.0000
C20               1.00   0.00  0.15  0.00  0.85  0.00  0.00  0.00     0.05   0.0000
C21               1.00   0.00  0.00  0.00  0.98  0.02  0.00  0.00     0.08   0.0000
C36               1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.04   0.0000
C37               1.00   0.00  0.96  0.00  0.04  0.00  0.00  0.00     0.00   0.0000
C38               1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.03   0.0000
C39               1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.03   0.0000
*************************
Conduit Surcharge Summary
*************************
No conduits were surcharged.
```

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.007        58.590
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.007        57.638
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....        0.000
**************************       Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.007         0.070
Groundwater Inflow .......        0.000         0.000
```

```
RDII Inflow ..............      0.000      0.000
External Inflow ..........      0.000      0.000
External Outflow .........      0.007      0.070
Internal Outflow .........      0.000      0.000
Storage Losses ...........      0.000      0.000
Initial Stored Volume ....      0.000      0.000
Final Stored Volume ......      0.000      0.000
Continuity Error (%) .....      0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
*************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
**************************
Subcatchment Runoff Summary
***************************
-------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total    Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff   Runoff  Coeff
Subcatchment         mm        mm        mm        mm        mm    10^6 ltr   CMS
-------------------------------------------------------------------------------------------------
S11                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S12                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S13                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S14                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S15                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S16                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S29                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S30                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
S31                58.59      0.00      0.00      0.00     57.64      0.01     0.01  0.984
*****************
Node Depth Summary
******************
-----------------------------------------------------------------------
                       Average  Maximum  Maximum  Time of Max
                         Depth    Depth      HGL   Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------------
J13           JUNCTION     0.00     0.15     0.42     0  00:17
J14           JUNCTION     0.00     0.16     0.39     0  00:17
J15           JUNCTION     0.00     0.18     0.36     0  00:17
J16           JUNCTION     0.00     0.19     0.33     0  00:17
J17           JUNCTION     0.00     0.20     0.29     0  00:17
J18           JUNCTION     0.00     0.21     0.25     0  00:17
J32           JUNCTION     0.00     0.13     0.44     0  00:17
J33           JUNCTION     0.00     0.10     0.46     0  00:17
J34           JUNCTION     0.00     0.08     0.48     0  00:17
J35           JUNCTION     0.00     0.02     0.48     0  00:16
Out3           OUTFALL     0.00     0.20     0.20     0  00:17
*******************
Node Inflow Summary
*******************
-------------------------------------------------------------------------------------
                       Maximum  Maximum                  Lateral     Total
                       Lateral    Total  Time of Max     Inflow    Inflow
                        Inflow    Inflow   Occurrence     Volume    Volume
Node          Type        CMS      CMS  days hr:min    10^6 ltr  10^6 ltr
-------------------------------------------------------------------------------------
J13           JUNCTION   0.008    0.036     0  00:16      0.007     0.033
J14           JUNCTION   0.008    0.044     0  00:16      0.007     0.040
J15           JUNCTION   0.008    0.052     0  00:16      0.007     0.048
J16           JUNCTION   0.008    0.060     0  00:16      0.007     0.055
```

J17	JUNCTION	0.008	0.068	0	00:17	0.007	0.063
J18	JUNCTION	0.008	0.076	0	00:17	0.007	0.070
J32	JUNCTION	0.008	0.028	0	00:16	0.007	0.025
J33	JUNCTION	0.008	0.020	0	00:16	0.007	0.018
J34	JUNCTION	0.011	0.012	0	00:16	0.010	0.011
J35	JUNCTION	0.000	0.000	0	00:11	0.000	0.000
Out3	OUTFALL	0.000	0.076	0	00:17	0.000	0.070

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out3	4.77	0.018	0.076	0.070
System	4.77	0.018	0.076	0.070

****
Link Flow Summary
****

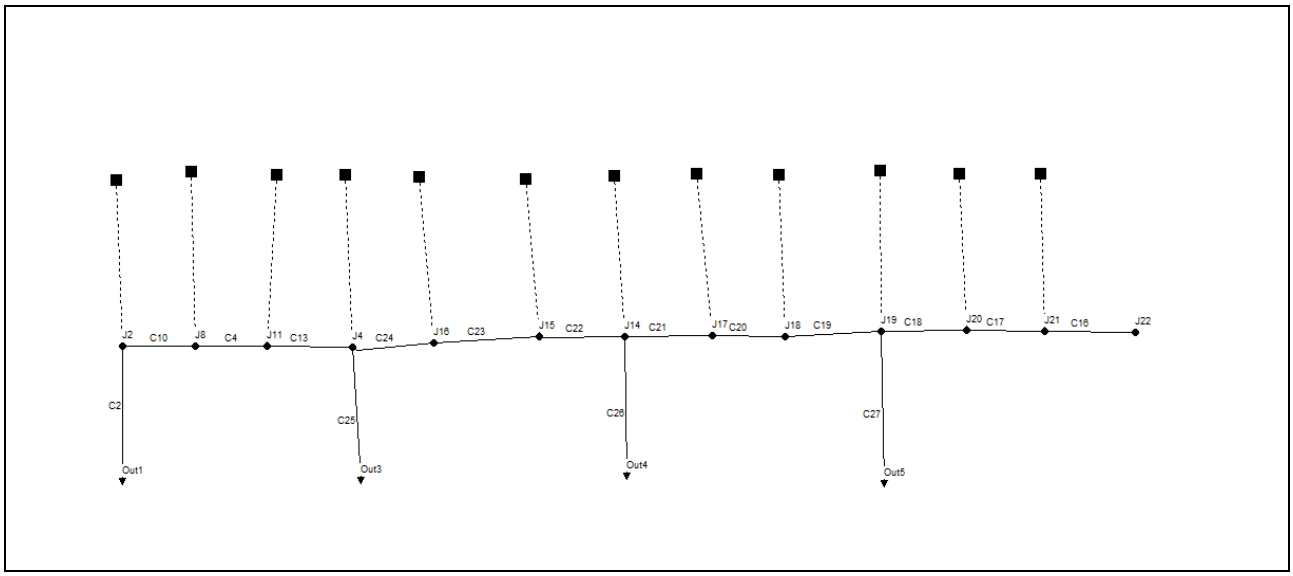
Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	0.036	0 00:17	0.83	0.28	0.40
C17	CONDUIT	0.044	0 00:17	0.89	0.35	0.45
C18	CONDUIT	0.052	0 00:17	0.95	0.41	0.49
C19	CONDUIT	0.060	0 00:17	1.01	0.47	0.52
C20	CONDUIT	0.068	0 00:17	1.10	0.54	0.54
C21	CONDUIT	0.076	0 00:17	1.23	0.60	0.54
C36	CONDUIT	0.028	0 00:17	0.76	0.22	0.36
C37	CONDUIT	0.000	0 00:17	0.03	0.00	0.12
C38	CONDUIT	0.011	0 00:17	0.55	0.09	0.24
C39	CONDUIT	0.020	0 00:17	0.67	0.15	0.30

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.05	0.0000
C17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
C20	1.00	0.00	0.15	0.00	0.84	0.00	0.00	0.06	0.0000
C21	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.09	0.0000
C36	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.05	0.0000
C37	1.00	0.00	0.96	0.00	0.04	0.00	0.00	0.00	0.0000
C38	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C39	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000

****
Conduit Surcharge Summary
****
No conduits were surcharged.

VERIFICA COLLETTORI – VIADOTTO AD EST DEL TORRENTE CROSTOLO



- Durata 15' – T_R25anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 01:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.006        35.438
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.006        34.528
Final Surface Storage ....        0.000         0.957
Continuity Error (%) .....       -0.133
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.006         0.061
```

```
  Groundwater Inflow .......        0.000        0.000
  RDII Inflow ..............      0.000        0.000
  External Inflow ..........      0.000        0.000
  External Outflow .........      0.006        0.061
  Internal Outflow .........      0.000        0.000
  Storage Losses ...........      0.000        0.000
  Initial Stored Volume ....      0.000        0.000
  Final Stored Volume ......      0.000        0.000
  Continuity Error (%) .....      0.000
  **************************
  Time-Step Critical Elements
  **************************
  Link C2 (20.98%)
  ********************************
  Highest Flow Instability Indexes
  ********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     0.58 sec
  Average Time Step           :     0.93 sec
  Maximum Time Step           :     1.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
  ***************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                      Total     Total     Total     Total     Total     Total     Peak  Runoff
                     Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
  Subcatchment           mm        mm        mm        mm        mm    10^6 ltr      LPS
  ---------------------------------------------------------------------------------------------------
  S3                   35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S8                   35.44      0.00      0.00      0.00     34.53      0.01    14.26   0.974
  S12                  35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S14                  35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S15                  35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S16                  35.44      0.00      0.00      0.00     34.53      0.01    14.26   0.974
  S17                  35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S18                  35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S19                  35.44      0.00      0.00      0.00     34.53      0.01    14.26   0.974
  S20                  35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S21                  35.44      0.00      0.00      0.00     34.53      0.00    10.19   0.974
  S22                  35.44      0.00      0.00      0.00     34.53      0.01    14.26   0.974
  ******************
  Node Depth Summary
  ******************
  -------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  -------------------------------------------------------------------
  J2            JUNCTION      0.01     0.05     0.05     0  00:08
  J4            JUNCTION      0.01     0.04     0.25     0  00:08
  J8            JUNCTION      0.03     0.13     0.19     0  00:08
  J11           JUNCTION      0.02     0.10     0.22     0  00:08
  J14           JUNCTION      0.01     0.04     0.45     0  00:08
  J15           JUNCTION      0.02     0.10     0.42     0  00:08
  J16           JUNCTION      0.03     0.13     0.39     0  00:08
  J17           JUNCTION      0.03     0.12     0.59     0  00:08
  J18           JUNCTION      0.02     0.10     0.63     0  00:08
  J19           JUNCTION      0.01     0.04     0.65     0  00:08
  J20           JUNCTION      0.03     0.12     0.79     0  00:08
  J21           JUNCTION      0.02     0.09     0.82     0  00:08
  J22           JUNCTION      0.00     0.01     0.82     0  00:08
  Out1           OUTFALL      0.01     0.05    -5.95     0  00:08
  Out3           OUTFALL      0.01     0.04    -5.96     0  00:08
  Out4           OUTFALL      0.01     0.04    -5.96     0  00:08
  Out5           OUTFALL      0.01     0.04    -5.96     0  00:08
  *******************
  Node Inflow Summary
  *******************
```

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J2	JUNCTION	10.19	37.44	0 00:08	0.004	0.017
J4	JUNCTION	10.19	37.36	0 00:08	0.004	0.017
J8	JUNCTION	10.19	27.60	0 00:08	0.004	0.012
J11	JUNCTION	14.26	17.60	0 00:08	0.006	0.008
J14	JUNCTION	10.19	37.08	0 00:08	0.004	0.017
J15	JUNCTION	14.26	17.52	0 00:08	0.006	0.008
J16	JUNCTION	10.19	27.52	0 00:08	0.004	0.012
J17	JUNCTION	10.19	27.23	0 00:08	0.004	0.012
J18	JUNCTION	14.26	17.21	0 00:08	0.006	0.008
J19	JUNCTION	10.19	34.09	0 00:08	0.004	0.015
J20	JUNCTION	10.19	24.10	0 00:08	0.004	0.011
J21	JUNCTION	14.26	14.26	0 00:08	0.006	0.006
J22	JUNCTION	0.00	0.30	0 00:08	0.000	0.000
Out1	OUTFALL	0.00	37.38	0 00:08	0.000	0.017
Out3	OUTFALL	0.00	33.94	0 00:08	0.000	0.015
Out4	OUTFALL	0.00	33.74	0 00:08	0.000	0.015
Out5	OUTFALL	0.00	31.08	0 00:08	0.000	0.014

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	56.81	11.23	37.38	0.017
Out3	55.27	10.49	33.94	0.015
Out4	55.04	10.47	33.74	0.015
Out5	53.47	9.94	31.08	0.014
System	55.15	42.13	136.14	0.061

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	37.38	0 00:08	7.17	0.13	0.24
C4	CONDUIT	17.42	0 00:08	0.74	0.26	0.40
C10	CONDUIT	27.28	0 00:08	1.70	0.40	0.30
C13	CONDUIT	3.34	0 00:08	0.26	0.05	0.25
C16	CONDUIT	0.30	0 00:08	0.05	0.00	0.16
C17	CONDUIT	13.91	0 00:08	0.68	0.21	0.36
C18	CONDUIT	23.91	0 00:08	1.67	0.35	0.28
C19	CONDUIT	2.95	0 00:08	0.24	0.04	0.25
C20	CONDUIT	17.05	0 00:08	0.74	0.25	0.39
C21	CONDUIT	26.92	0 00:08	1.73	0.40	0.29
C22	CONDUIT	3.26	0 00:08	0.26	0.05	0.25
C23	CONDUIT	17.35	0 00:08	0.74	0.26	0.40
C24	CONDUIT	27.20	0 00:08	1.73	0.40	0.30
C25	CONDUIT	33.94	0 00:08	7.05	0.11	0.23
C26	CONDUIT	33.74	0 00:08	7.12	0.11	0.22
C27	CONDUIT	31.08	0 00:08	7.03	0.10	0.21

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C2	1.00	0.01	0.00	0.00	0.07	0.91	0.00	0.00	7.73	0.0001
C4	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.52	0.0001
C10	1.00	0.01	0.00	0.00	0.32	0.67	0.00	0.00	1.35	0.0002
C13	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.30	0.0000
C16	1.00	0.01	0.13	0.00	0.86	0.00	0.00	0.00	0.05	0.0000
C17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.48	0.0001
C18	1.00	0.01	0.00	0.00	0.34	0.65	0.00	0.00	1.34	0.0002
C19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.28	0.0000
C20	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.52	0.0001
C21	1.00	0.01	0.00	0.00	0.31	0.68	0.00	0.00	1.38	0.0002
C22	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.30	0.0000
C23	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.52	0.0001
C24	1.00	0.01	0.00	0.00	0.31	0.68	0.00	0.00	1.38	0.0002
C25	1.00	0.01	0.00	0.00	0.10	0.89	0.00	0.00	7.65	0.0001
C26	1.00	0.01	0.00	0.00	0.11	0.88	0.00	0.00	7.70	0.0001
C27	1.00	0.01	0.00	0.00	0.14	0.84	0.00	0.00	7.53	0.0001

****
Conduit Surcharge Summary
****
No conduits were surcharged.

- Durata 15' – T_R100anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 01:00:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.008	46.400
Evaporation Loss	0.000	0.000
Infiltration Loss	0.000	0.000
Surface Runoff	0.008	45.510
Final Surface Storage	0.000	0.957
Continuity Error (%)	-0.146	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.008	0.080
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000

```
External Inflow .........      0.000      0.000
External Outflow .........     0.008      0.080
Internal Outflow .........    0.000      0.000
Storage Losses ...........     0.000      0.000
Initial Stored Volume ....     0.000      0.000
Final Stored Volume ......     0.000      0.000
Continuity Error (%) .....     0.000
**************************
Time-Step Critical Elements
**************************
Link C2 (25.09%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :    0.54 sec
Average Time Step          :    0.90 sec
Maximum Time Step          :    1.00 sec
Percent in Steady State    :    0.00
Average Iterations per Step :   2.00
**************************
Subcatchment Runoff Summary
**************************
-----------------------------------------------------------------------------------------------------
                    Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip     Runon      Evap      Infil    Runoff    Runoff    Runoff   Coeff
Subcatchment          mm        mm        mm        mm        mm    10^6 ltr     LPS
-----------------------------------------------------------------------------------------------------
S3                  46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S8                  46.40      0.00      0.00      0.00     45.51      0.01    18.70   0.981
S12                 46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S14                 46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S15                 46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S16                 46.40      0.00      0.00      0.00     45.51      0.01    18.70   0.981
S17                 46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S18                 46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S19                 46.40      0.00      0.00      0.00     45.51      0.01    18.70   0.981
S20                 46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S21                 46.40      0.00      0.00      0.00     45.51      0.01    13.36   0.981
S22                 46.40      0.00      0.00      0.00     45.51      0.01    18.70   0.981
******************
Node Depth Summary
******************
-----------------------------------------------------------------------
                      Average  Maximum  Maximum  Time of Max
                        Depth    Depth      HGL   Occurrence
Node          Type      Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------------
J2          JUNCTION     0.01     0.05     0.05     0  00:08
J4          JUNCTION     0.01     0.05     0.25     0  00:08
J8          JUNCTION     0.04     0.15     0.21     0  00:08
J11         JUNCTION     0.03     0.12     0.24     0  00:08
J14         JUNCTION     0.01     0.05     0.46     0  00:08
J15         JUNCTION     0.03     0.12     0.44     0  00:08
J16         JUNCTION     0.04     0.15     0.41     0  00:08
J17         JUNCTION     0.04     0.15     0.61     0  00:08
J18         JUNCTION     0.03     0.12     0.65     0  00:08
J19         JUNCTION     0.01     0.05     0.66     0  00:08
J20         JUNCTION     0.03     0.14     0.81     0  00:08
J21         JUNCTION     0.03     0.10     0.84     0  00:08
J22         JUNCTION     0.00     0.02     0.84     0  00:08
Out1        OUTFALL      0.01     0.05    -5.95     0  00:08
Out3        OUTFALL      0.01     0.05    -5.95     0  00:08
Out4        OUTFALL      0.01     0.05    -5.95     0  00:08
Out5        OUTFALL      0.01     0.05    -5.95     0  00:08
*******************
Node Inflow Summary
*******************
-------------------------------------------------------------------------------------
                      Maximum  Maximum                  Lateral       Total
```

Node	Type	Lateral Inflow LPS	Total Inflow LPS	Time of Max Occurrence days hr:min	Inflow Volume 10^6 ltr	Inflow Volume 10^6 ltr
J2	JUNCTION	13.36	49.27	0 00:08	0.006	0.022
J4	JUNCTION	13.36	49.17	0 00:08	0.006	0.022
J8	JUNCTION	13.36	36.28	0 00:08	0.006	0.016
J11	JUNCTION	18.70	23.13	0 00:08	0.008	0.010
J14	JUNCTION	13.36	48.76	0 00:08	0.006	0.022
J15	JUNCTION	18.70	23.02	0 00:08	0.008	0.010
J16	JUNCTION	13.36	36.18	0 00:08	0.006	0.016
J17	JUNCTION	13.36	35.76	0 00:08	0.006	0.016
J18	JUNCTION	18.70	22.58	0 00:08	0.008	0.010
J19	JUNCTION	13.36	44.48	0 00:08	0.006	0.020
J20	JUNCTION	13.36	31.36	0 00:08	0.006	0.014
J21	JUNCTION	18.70	18.70	0 00:08	0.008	0.008
J22	JUNCTION	0.00	0.63	0 00:08	0.000	0.000
Out1	OUTFALL	0.00	49.22	0 00:08	0.000	0.022
Out3	OUTFALL	0.00	44.66	0 00:08	0.000	0.020
Out4	OUTFALL	0.00	44.36	0 00:08	0.000	0.020
Out5	OUTFALL	0.00	40.55	0 00:08	0.000	0.018

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	58.27	15.33	49.22	0.022
Out3	56.79	14.29	44.66	0.020
Out4	56.57	14.25	44.36	0.020
Out5	55.16	13.47	40.55	0.018
System	56.70	57.35	178.78	0.080

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	49.22	0 00:08	7.76	0.16	0.27
C4	CONDUIT	22.94	0 00:08	0.79	0.34	0.47
C10	CONDUIT	35.94	0 00:08	1.81	0.53	0.35
C13	CONDUIT	4.43	0 00:08	0.28	0.07	0.30
C16	CONDUIT	0.69	0 00:08	0.07	0.01	0.22
C17	CONDUIT	18.02	0 00:08	0.72	0.27	0.42
C18	CONDUIT	31.14	0 00:08	1.78	0.46	0.32
C19	CONDUIT	3.88	0 00:08	0.26	0.06	0.29
C20	CONDUIT	22.42	0 00:08	0.78	0.33	0.46
C21	CONDUIT	35.43	0 00:08	1.84	0.52	0.34
C22	CONDUIT	4.33	0 00:08	0.28	0.06	0.29
C23	CONDUIT	22.84	0 00:08	0.79	0.34	0.47
C24	CONDUIT	35.84	0 00:08	1.84	0.53	0.35
C25	CONDUIT	44.66	0 00:08	7.64	0.15	0.26
C26	CONDUIT	44.36	0 00:08	7.71	0.14	0.26
C27	CONDUIT	40.55	0 00:08	7.60	0.13	0.24

****
Flow Classification Summary
****

	Adjusted /Actual	--- Fraction of Time in Flow Class ---- Up	Down	Sub	Sup	Up	Down	Avg. Froude	Avg. Flow

Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Number	Change
C2	1.00	0.01	0.00	0.00	0.07	0.92	0.00	0.00	7.93	0.0001
C4	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.53	0.0002
C10	1.00	0.01	0.00	0.00	0.31	0.68	0.00	0.00	1.38	0.0003
C13	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.30	0.0000
C16	1.00	0.01	0.10	0.00	0.89	0.00	0.00	0.00	0.07	0.0000
C17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.49	0.0001
C18	1.00	0.01	0.00	0.00	0.32	0.66	0.00	0.00	1.38	0.0002
C19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.29	0.0000
C20	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.52	0.0002
C21	1.00	0.01	0.00	0.00	0.30	0.69	0.00	0.00	1.40	0.0003
C22	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.30	0.0000
C23	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.53	0.0002
C24	1.00	0.01	0.00	0.00	0.29	0.69	0.00	0.00	1.41	0.0003
C25	1.00	0.01	0.00	0.00	0.09	0.89	0.00	0.00	7.85	0.0001
C26	1.00	0.01	0.00	0.00	0.10	0.89	0.00	0.00	7.93	0.0001
C27	1.00	0.01	0.00	0.00	0.13	0.86	0.00	0.00	7.78	0.0001

****
Conduit Surcharge Summary
****
No conduits were surcharged.

- Durata 30' – T_R100anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 01:00:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec

********** Runoff Quantity Continuity **********	Volume hectare-m ---------	Depth mm -------
Total Precipitation	0.010	58.590
Evaporation Loss	0.000	0.000
Infiltration Loss	0.000	0.000
Surface Runoff	0.010	57.630
Final Surface Storage	0.000	0.961
Continuity Error (%)	0.000	

********** Flow Routing Continuity **********	Volume hectare-m ---------	Volume 10^6 ltr ---------
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.010	0.102
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000

```
External Outflow .....        0.010        0.102
Internal Outflow .....       0.000        0.000
Storage Losses .....         0.000        0.000
Initial Stored Volume ....    0.000        0.000
Final Stored Volume ......     0.000        0.000
Continuity Error (%) .....    0.000
**************************
Time-Step Critical Elements
**************************
Link C2 (34.56%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :    0.62 sec
Average Time Step          :    0.89 sec
Maximum Time Step          :    1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S3	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S8	58.59	0.00	0.00	0.00	57.63	0.01	11.45	0.984
S12	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S14	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S15	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S16	58.59	0.00	0.00	0.00	57.63	0.01	11.45	0.984
S17	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S18	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S19	58.59	0.00	0.00	0.00	57.63	0.01	11.45	0.984
S20	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S21	58.59	0.00	0.00	0.00	57.63	0.01	8.18	0.984
S22	58.59	0.00	0.00	0.00	57.63	0.01	11.45	0.984

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J2	JUNCTION	0.02	0.04	0.04	0 00:17
J4	JUNCTION	0.02	0.04	0.24	0 00:17
J8	JUNCTION	0.05	0.11	0.17	0 00:17
J11	JUNCTION	0.04	0.09	0.21	0 00:17
J14	JUNCTION	0.02	0.04	0.45	0 00:17
J15	JUNCTION	0.04	0.09	0.41	0 00:17
J16	JUNCTION	0.05	0.11	0.38	0 00:17
J17	JUNCTION	0.05	0.11	0.58	0 00:17
J18	JUNCTION	0.04	0.09	0.62	0 00:17
J19	JUNCTION	0.02	0.04	0.65	0 00:17
J20	JUNCTION	0.04	0.10	0.78	0 00:17
J21	JUNCTION	0.03	0.08	0.81	0 00:17
J22	JUNCTION	0.00	0.00	0.82	0 00:00
Out1	OUTFALL	0.02	0.04	-5.96	0 00:17
Out3	OUTFALL	0.02	0.04	-5.96	0 00:17
Out4	OUTFALL	0.02	0.04	-5.96	0 00:17
Out5	OUTFALL	0.02	0.04	-5.96	0 00:17

```
*******************
Node Inflow Summary
*******************
```

	Maximum Lateral	Maximum Total	Time of Max	Lateral Inflow	Total Inflow

Node	Type	Inflow LPS	Inflow LPS	Occurrence days hr:min	Volume 10^6 ltr	Volume 10^6 ltr
J2	JUNCTION	8.18	30.50	0 00:17	0.007	0.028
J4	JUNCTION	8.18	30.44	0 00:17	0.007	0.028
J8	JUNCTION	8.18	22.34	0 00:17	0.007	0.020
J11	JUNCTION	11.45	14.16	0 00:17	0.010	0.013
J14	JUNCTION	8.18	30.20	0 00:17	0.007	0.028
J15	JUNCTION	11.45	14.10	0 00:17	0.010	0.013
J16	JUNCTION	8.18	22.27	0 00:17	0.007	0.020
J17	JUNCTION	8.18	22.03	0 00:17	0.007	0.020
J18	JUNCTION	11.45	13.85	0 00:17	0.010	0.013
J19	JUNCTION	8.18	27.80	0 00:17	0.007	0.025
J20	JUNCTION	8.18	19.63	0 00:17	0.007	0.018
J21	JUNCTION	11.45	11.45	0 00:17	0.010	0.010
J22	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
Out1	OUTFALL	0.00	30.50	0 00:17	0.000	0.028
Out3	OUTFALL	0.00	27.73	0 00:17	0.000	0.025
Out4	OUTFALL	0.00	27.54	0 00:17	0.000	0.025
Out5	OUTFALL	0.00	25.40	0 00:17	0.000	0.023

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out1	79.35	12.11	30.50	0.028
Out3	77.85	11.23	27.73	0.025
Out4	77.60	11.19	27.54	0.025
Out5	75.73	10.58	25.40	0.023
System	77.63	45.12	111.17	0.102

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C2	CONDUIT	30.50	0 00:17	6.76	0.10	0.22
C4	CONDUIT	14.16	0 00:17	0.70	0.21	0.35
C10	CONDUIT	22.32	0 00:17	1.61	0.33	0.27
C13	CONDUIT	2.71	0 00:17	0.25	0.04	0.23
C16	CONDUIT	0.00	0 00:00	0.00	0.00	0.14
C17	CONDUIT	11.45	0 00:17	0.64	0.17	0.32
C18	CONDUIT	19.62	0 00:17	1.59	0.29	0.25
C19	CONDUIT	2.40	0 00:17	0.23	0.04	0.22
C20	CONDUIT	13.85	0 00:17	0.69	0.20	0.35
C21	CONDUIT	22.02	0 00:17	1.64	0.33	0.26
C22	CONDUIT	2.65	0 00:17	0.25	0.04	0.22
C23	CONDUIT	14.09	0 00:17	0.70	0.21	0.35
C24	CONDUIT	22.26	0 00:17	1.64	0.33	0.27
C25	CONDUIT	27.73	0 00:17	6.65	0.09	0.20
C26	CONDUIT	27.54	0 00:17	6.72	0.09	0.20
C27	CONDUIT	25.40	0 00:17	6.63	0.08	0.19

****
Flow Classification Summary
****

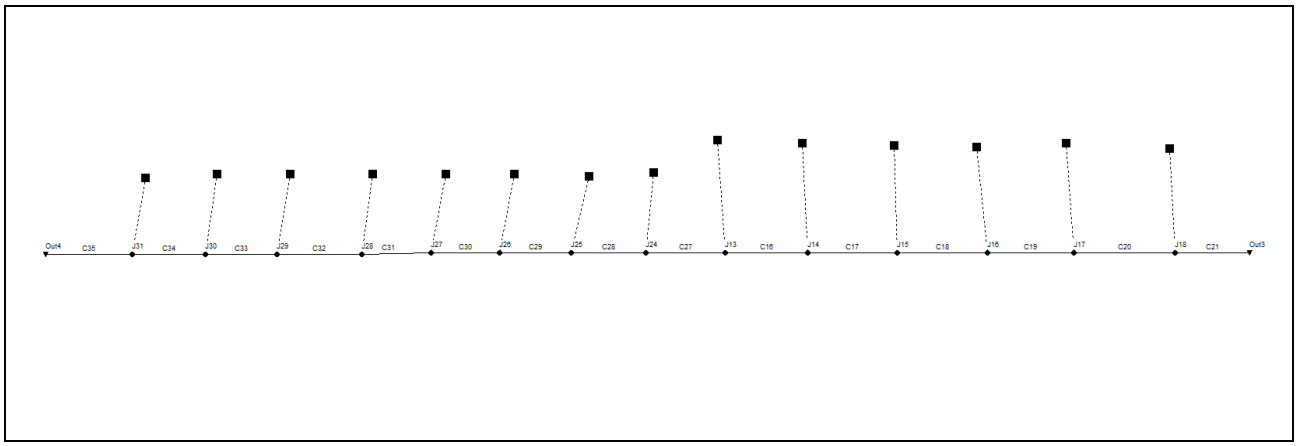
Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Froude Number	Avg. Flow Change

---

C2	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	9.63	0.0001
C4	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.64	0.0001
C10	1.00	0.02	0.00	0.00	0.10	0.88	0.00	0.00	1.68	0.0002
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.32	0.0000
C16	1.00	0.02	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C17	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.60	0.0001
C18	1.00	0.02	0.00	0.00	0.12	0.86	0.00	0.00	1.69	0.0001
C19	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.29	0.0000
C20	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.63	0.0001
C21	1.00	0.02	0.00	0.00	0.08	0.89	0.00	0.00	1.72	0.0002
C22	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.32	0.0000
C23	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.64	0.0001
C24	1.00	0.02	0.00	0.00	0.08	0.90	0.00	0.00	1.72	0.0002
C25	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	9.69	0.0000
C26	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	9.82	0.0000
C27	1.00	0.02	0.00	0.00	0.01	0.97	0.00	0.00	9.85	0.0000

****
Conduit Surcharge Summary
****
No conduits were surcharged.

VERIFICA COLLETTORI – VIADOTTO CASA GALLINARI



- Durata 15' – T_R25anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.008        35.438
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.000
Surface Runoff ...........         0.008        34.529
Final Surface Storage ....         0.000         0.953
Continuity Error (%) .....        -0.122
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.008         0.078
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.008         0.078
Internal Outflow .........         0.000         0.000
```

```
Storage Losses ..........        0.000        0.000
Initial Stored Volume ....        0.000        0.000
Final Stored Volume ......        0.000        0.000
Continuity Error (%) .....        0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :    1.00 sec
Average Time Step          :    1.00 sec
Maximum Time Step          :    1.00 sec
Percent in Steady State    :    0.00
Average Iterations per Step :    2.00
**************************
Subcatchment Runoff Summary
**************************
-----------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment         mm        mm        mm        mm        mm    10^6 ltr    CMS
-----------------------------------------------------------------------------------------------------
S11                35.44      0.00      0.00      0.00     34.53      0.01     0.02  0.974
S12                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S13                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S14                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S15                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S16                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S22                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S23                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S24                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S25                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S26                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S27                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S28                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
S29                35.44      0.00      0.00      0.00     34.53      0.01     0.01  0.974
******************
Node Depth Summary
******************
-----------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
Node          Type        Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------------
J13          JUNCTION      0.00     0.09    49.02    0  00:08
J14          JUNCTION      0.00     0.12    49.02    0  00:08
J15          JUNCTION      0.00     0.14    49.01    0  00:08
J16          JUNCTION      0.00     0.16    49.00    0  00:08
J17          JUNCTION      0.00     0.18    48.99    0  00:08
J18          JUNCTION      0.00     0.18    48.96    0  00:08
J24          JUNCTION      0.00     0.12    49.00    0  00:08
J25          JUNCTION      0.00     0.14    48.98    0  00:08
J26          JUNCTION      0.00     0.16    48.96    0  00:08
J27          JUNCTION      0.00     0.18    48.94    0  00:08
J28          JUNCTION      0.00     0.19    48.91    0  00:08
J29          JUNCTION      0.00     0.21    48.88    0  00:08
J30          JUNCTION      0.00     0.22    48.84    0  00:09
J31          JUNCTION      0.00     0.22    48.81    0  00:09
Out3          OUTFALL      0.00     0.17    48.92    0  00:08
Out4          OUTFALL      0.00     0.22    48.76    0  00:09
*******************
Node Inflow Summary
*******************
-------------------------------------------------------------------------------------
                        Maximum  Maximum                  Lateral     Total
                        Lateral    Total  Time of Max      Inflow    Inflow
                         Inflow   Inflow   Occurrence      Volume    Volume
```

Node	Type	CMS	CMS	days	hr:min	10^6 ltr	10^6 ltr
J13	JUNCTION	0.023	0.023	0	00:08	0.010	0.010
J14	JUNCTION	0.012	0.019	0	00:08	0.005	0.009
J15	JUNCTION	0.012	0.030	0	00:08	0.005	0.014
J16	JUNCTION	0.012	0.042	0	00:08	0.005	0.019
J17	JUNCTION	0.012	0.053	0	00:08	0.005	0.025
J18	JUNCTION	0.012	0.063	0	00:08	0.005	0.030
J24	JUNCTION	0.012	0.027	0	00:08	0.005	0.012
J25	JUNCTION	0.012	0.039	0	00:08	0.005	0.017
J26	JUNCTION	0.012	0.050	0	00:08	0.005	0.022
J27	JUNCTION	0.012	0.061	0	00:08	0.005	0.027
J28	JUNCTION	0.012	0.071	0	00:08	0.005	0.032
J29	JUNCTION	0.012	0.081	0	00:08	0.005	0.038
J30	JUNCTION	0.012	0.092	0	00:08	0.005	0.043
J31	JUNCTION	0.012	0.103	0	00:09	0.005	0.048
Out3	OUTFALL	0.000	0.063	0	00:08	0.000	0.030
Out4	OUTFALL	0.000	0.103	0	00:09	0.000	0.048

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out3	2.97	0.012	0.063	0.030
Out4	3.65	0.016	0.103	0.048
System	3.31	0.028	0.165	0.078

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	0.008	0	00:07	0.35	0.04	0.22
C17	CONDUIT	0.019	0	00:08	0.48	0.10	0.28
C18	CONDUIT	0.030	0	00:08	0.61	0.16	0.33
C19	CONDUIT	0.041	0	00:08	0.73	0.22	0.36
C20	CONDUIT	0.052	0	00:08	0.87	0.28	0.38
C21	CONDUIT	0.063	0	00:08	1.07	0.34	0.37
C27	CONDUIT	0.016	0	00:08	0.56	0.07	0.22
C28	CONDUIT	0.027	0	00:08	0.70	0.12	0.28
C29	CONDUIT	0.038	0	00:08	0.80	0.17	0.32
C30	CONDUIT	0.049	0	00:08	0.87	0.22	0.36
C31	CONDUIT	0.060	0	00:08	0.94	0.27	0.40
C32	CONDUIT	0.071	0	00:08	1.00	0.32	0.43
C33	CONDUIT	0.082	0	00:08	1.07	0.37	0.45
C34	CONDUIT	0.092	0	00:09	1.16	0.42	0.47
C35	CONDUIT	0.103	0	00:09	1.28	0.47	0.47

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000
C17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C18	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.04	0.0000
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000

```
C20          1.00  0.00  0.23  0.00  0.77  0.00  0.00  0.00   0.04  0.0000
C21          1.00  0.00  0.00  0.00  0.99  0.01  0.00  0.00   0.06  0.0000
C27          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00   0.02  0.0000
C28          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00   0.03  0.0000
C29          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00   0.04  0.0000
C30          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00   0.04  0.0000
C31          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00   0.05  0.0000
C32          1.00  0.00  0.01  0.00  0.99  0.00  0.00  0.00   0.05  0.0000
C33          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00   0.06  0.0000
C34          1.00  0.00  0.19  0.00  0.80  0.00  0.00  0.00   0.05  0.0000
C35          1.00  0.00  0.00  0.00  0.98  0.02  0.00  0.00   0.07  0.0000
*************************
Conduit Surcharge Summary
*************************
No conduits were surcharged.
```

- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************************
***************
Analysis Options
***************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.010        46.400
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.010        45.510
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....       -0.135
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.010         0.102
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.010         0.102
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
***************************
```

Time-Step Critical Elements
****
None
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 1.00 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff CMS
S11	46.40	0.00	0.00	0.00	45.51	0.01	0.03	0.981
S12	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S13	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S14	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S15	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S16	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S22	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S23	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S24	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S25	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S26	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S27	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S28	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981
S29	46.40	0.00	0.00	0.00	45.51	0.01	0.02	0.981

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J13	JUNCTION	0.00	0.11	49.04	0 00:08
J14	JUNCTION	0.00	0.14	49.04	0 00:08
J15	JUNCTION	0.00	0.17	49.04	0 00:08
J16	JUNCTION	0.00	0.19	49.03	0 00:08
J17	JUNCTION	0.00	0.20	49.01	0 00:08
J18	JUNCTION	0.00	0.21	48.99	0 00:08
J24	JUNCTION	0.00	0.14	49.03	0 00:08
J25	JUNCTION	0.00	0.17	49.01	0 00:08
J26	JUNCTION	0.00	0.19	48.99	0 00:08
J27	JUNCTION	0.00	0.21	48.97	0 00:08
J28	JUNCTION	0.00	0.23	48.95	0 00:08
J29	JUNCTION	0.00	0.25	48.92	0 00:08
J30	JUNCTION	0.00	0.26	48.88	0 00:08
J31	JUNCTION	0.00	0.26	48.84	0 00:08
Out3	OUTFALL	0.00	0.19	48.94	0 00:08
Out4	OUTFALL	0.00	0.26	48.80	0 00:09

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J13	JUNCTION	0.031	0.031	0 00:08	0.014	0.014
J14	JUNCTION	0.015	0.023	0 00:08	0.007	0.011
J15	JUNCTION	0.015	0.038	0 00:08	0.007	0.018

J16	JUNCTION	0.015	0.053	0	00:08	0.007	0.025
J17	JUNCTION	0.015	0.068	0	00:08	0.007	0.032
J18	JUNCTION	0.015	0.082	0	00:08	0.007	0.039
J24	JUNCTION	0.015	0.038	0	00:08	0.007	0.016
J25	JUNCTION	0.015	0.052	0	00:08	0.007	0.023
J26	JUNCTION	0.015	0.067	0	00:08	0.007	0.030
J27	JUNCTION	0.015	0.081	0	00:08	0.007	0.036
J28	JUNCTION	0.015	0.095	0	00:08	0.007	0.043
J29	JUNCTION	0.015	0.109	0	00:08	0.007	0.050
J30	JUNCTION	0.015	0.123	0	00:08	0.007	0.057
J31	JUNCTION	0.015	0.137	0	00:09	0.007	0.064
Out3	OUTFALL	0.000	0.082	0	00:08	0.000	0.039
Out4	OUTFALL	0.000	0.137	0	00:09	0.000	0.064

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out3	2.99	0.016	0.082	0.039
Out4	3.67	0.021	0.137	0.064
System	3.33	0.036	0.217	0.102

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	0.008	0	00:07	0.36	0.05	0.26
C17	CONDUIT	0.023	0	00:08	0.48	0.12	0.32
C18	CONDUIT	0.037	0	00:08	0.63	0.20	0.38
C19	CONDUIT	0.052	0	00:08	0.77	0.29	0.42
C20	CONDUIT	0.067	0	00:08	0.93	0.37	0.44
C21	CONDUIT	0.082	0	00:08	1.16	0.45	0.43
C27	CONDUIT	0.022	0	00:08	0.60	0.10	0.27
C28	CONDUIT	0.037	0	00:08	0.74	0.17	0.33
C29	CONDUIT	0.052	0	00:08	0.84	0.23	0.38
C30	CONDUIT	0.066	0	00:08	0.93	0.30	0.43
C31	CONDUIT	0.080	0	00:08	1.00	0.36	0.47
C32	CONDUIT	0.095	0	00:08	1.07	0.43	0.51
C33	CONDUIT	0.109	0	00:08	1.15	0.49	0.53
C34	CONDUIT	0.123	0	00:08	1.25	0.56	0.55
C35	CONDUIT	0.137	0	00:09	1.40	0.62	0.55

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000
C17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000
C20	1.00	0.00	0.24	0.00	0.76	0.00	0.00	0.04	0.0000
C21	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.06	0.0000
C27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000
C28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000

```
C30          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00    0.04  0.0000
C31          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00    0.05  0.0000
C32          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00    0.05  0.0000
C33          1.00  0.00  0.00  0.00  1.00  0.00  0.00  0.00    0.06  0.0000
C34          1.00  0.00  0.21  0.00  0.79  0.00  0.00  0.00    0.05  0.0000
C35          1.00  0.00  0.00  0.00  0.98  0.02  0.00  0.00    0.07  0.0000
*************************
Conduit Surcharge Summary
*************************
No conduits were surcharged.
```

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.013        58.590
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.013        57.638
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....        0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
***************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.013         0.130
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.013         0.130
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
****************************
Time-Step Critical Elements
****************************
None
********************************
Highest Flow Instability Indexes
********************************
```

All links are stable.
****

Routing Time Step Summary
****

Minimum Time Step : 1.00 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff CMS
S11	58.59	0.00	0.00	0.00	57.64	0.02	0.02	0.984
S12	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S13	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S14	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S15	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S16	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S22	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S23	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S24	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S25	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S26	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S27	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S28	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984
S29	58.59	0.00	0.00	0.00	57.64	0.01	0.01	0.984

****

Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J13	JUNCTION	0.00	0.08	49.01	0 00:17
J14	JUNCTION	0.00	0.10	49.00	0 00:17
J15	JUNCTION	0.00	0.13	49.00	0 00:17
J16	JUNCTION	0.00	0.15	48.99	0 00:17
J17	JUNCTION	0.00	0.16	48.97	0 00:17
J18	JUNCTION	0.00	0.17	48.95	0 00:17
J24	JUNCTION	0.00	0.10	48.99	0 00:17
J25	JUNCTION	0.00	0.13	48.97	0 00:17
J26	JUNCTION	0.00	0.14	48.94	0 00:17
J27	JUNCTION	0.00	0.16	48.92	0 00:17
J28	JUNCTION	0.00	0.18	48.89	0 00:17
J29	JUNCTION	0.00	0.19	48.86	0 00:17
J30	JUNCTION	0.00	0.20	48.83	0 00:17
J31	JUNCTION	0.00	0.20	48.79	0 00:17
Out3	OUTFALL	0.00	0.16	48.91	0 00:17
Out4	OUTFALL	0.00	0.20	48.74	0 00:17

****

Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J13	JUNCTION	0.019	0.019	0 00:16	0.017	0.017
J14	JUNCTION	0.009	0.016	0 00:15	0.009	0.016
J15	JUNCTION	0.009	0.025	0 00:16	0.009	0.024
J16	JUNCTION	0.009	0.035	0 00:16	0.009	0.033
J17	JUNCTION	0.009	0.044	0 00:16	0.009	0.041
J18	JUNCTION	0.009	0.053	0 00:16	0.009	0.050
J24	JUNCTION	0.009	0.022	0 00:16	0.009	0.019
J25	JUNCTION	0.009	0.031	0 00:16	0.009	0.028
J26	JUNCTION	0.009	0.041	0 00:16	0.009	0.036

J27	JUNCTION	0.009	0.050	0	00:16	0.009	0.045
J28	JUNCTION	0.009	0.059	0	00:16	0.009	0.054
J29	JUNCTION	0.009	0.069	0	00:16	0.009	0.062
J30	JUNCTION	0.009	0.078	0	00:17	0.009	0.071
J31	JUNCTION	0.009	0.088	0	00:17	0.009	0.080
Out3	OUTFALL	0.000	0.053	0	00:17	0.000	0.050
Out4	OUTFALL	0.000	0.088	0	00:17	0.000	0.080

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out3	3.96	0.015	0.053	0.050
Out4	4.65	0.021	0.088	0.080
System	4.30	0.036	0.141	0.130

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	0.006	0 00:15	0.33	0.04	0.19
C17	CONDUIT	0.016	0 00:16	0.47	0.09	0.25
C18	CONDUIT	0.025	0 00:17	0.59	0.14	0.29
C19	CONDUIT	0.035	0 00:17	0.70	0.19	0.33
C20	CONDUIT	0.044	0 00:17	0.82	0.24	0.35
C21	CONDUIT	0.053	0 00:17	1.02	0.29	0.34
C27	CONDUIT	0.013	0 00:17	0.53	0.06	0.19
C28	CONDUIT	0.022	0 00:17	0.67	0.10	0.24
C29	CONDUIT	0.031	0 00:17	0.76	0.14	0.29
C30	CONDUIT	0.041	0 00:17	0.84	0.18	0.32
C31	CONDUIT	0.050	0 00:17	0.90	0.23	0.36
C32	CONDUIT	0.059	0 00:17	0.96	0.27	0.39
C33	CONDUIT	0.069	0 00:17	1.02	0.31	0.41
C34	CONDUIT	0.078	0 00:17	1.10	0.36	0.43
C35	CONDUIT	0.088	0 00:17	1.22	0.40	0.43

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000
C18	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.04	0.0000
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.05	0.0000
C20	1.00	0.00	0.22	0.00	0.78	0.00	0.00	0.04	0.0000
C21	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.07	0.0000
C27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.03	0.0000
C28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000
C29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000
C30	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.05	0.0000
C31	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
C32	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.06	0.0000
C33	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
C34	1.00	0.00	0.18	0.00	0.82	0.00	0.00	0.06	0.0000
C35	1.00	0.00	0.00	0.00	0.97	0.02	0.00	0.08	0.0000

****
Conduit Surcharge Summary
****
No conduits were surcharged.

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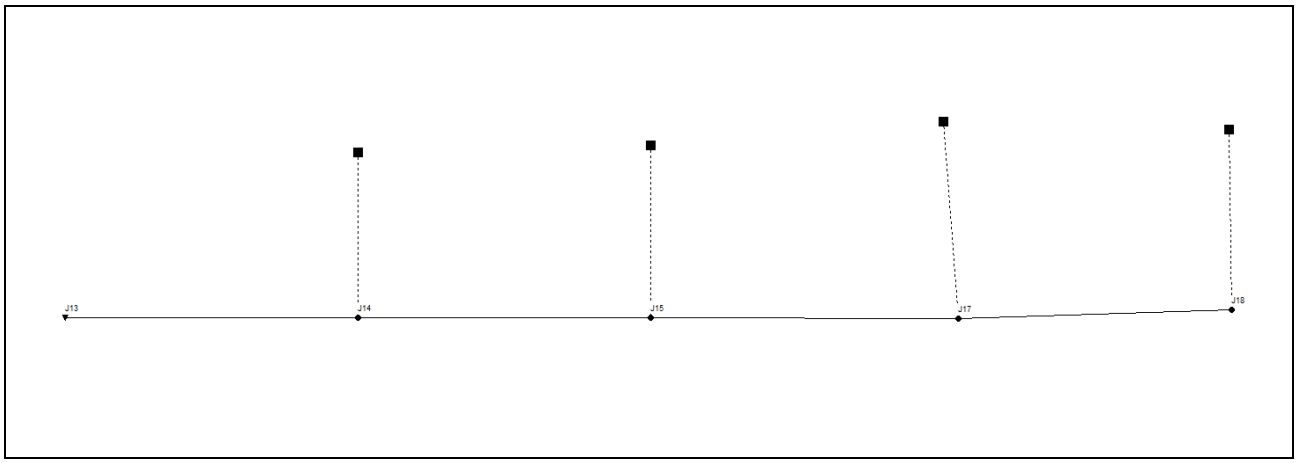


- Durata 15' – T_R25anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.001        35.438
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.001        34.532
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.001         0.011
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.001         0.011
Internal Outflow .........        0.000         0.000
```

```
Storage Losses ...........        0.000        0.000
Initial Stored Volume ....        0.000        0.000
Final Stored Volume ......        0.000        0.000
Continuity Error (%) .....        0.000
**************************
Time-Step Critical Elements
**************************
None
*******************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
*************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
**************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------
                   Total     Total     Total     Total     Total     Total    Peak  Runoff
                  Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
Subcatchment          mm        mm        mm        mm        mm    10^6 ltr     CMS
-----------------------------------------------------------------------------------------------
S12                35.44      0.00      0.00      0.00     34.53      0.00     0.01   0.974
S13                35.44      0.00      0.00      0.00     34.53      0.00     0.01   0.974
S15                35.44      0.00      0.00      0.00     34.53      0.00     0.01   0.974
S16                35.44      0.00      0.00      0.00     34.53      0.00     0.01   0.974
******************
Node Depth Summary
******************
-----------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
Node          Type        Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------
J14           JUNCTION      0.00     0.14     0.15     0  00:08
J15           JUNCTION      0.00     0.15     0.17     0  00:08
J17           JUNCTION      0.00     0.14     0.17     0  00:08
J18           JUNCTION      0.00     0.14     0.18     0  00:08
J13           OUTFALL       0.00     0.12     0.12     0  00:08
*******************
Node Inflow Summary
*******************
-------------------------------------------------------------------------------------
                        Maximum  Maximum                  Lateral       Total
                        Lateral    Total  Time of Max      Inflow      Inflow
                         Inflow   Inflow   Occurrence      Volume      Volume
Node          Type          CMS      CMS  days hr:min    10^6 ltr    10^6 ltr
-------------------------------------------------------------------------------------
J14           JUNCTION    0.006    0.023     0  00:08       0.003       0.011
J15           JUNCTION    0.006    0.018     0  00:08       0.003       0.008
J17           JUNCTION    0.006    0.012     0  00:08       0.003       0.006
J18           JUNCTION    0.006    0.006     0  00:08       0.003       0.003
J13           OUTFALL     0.000    0.023     0  00:08       0.000       0.011
**********************
Node Surcharge Summary
**********************
No nodes were surcharged.
*********************
Node Flooding Summary
*********************
No nodes were flooded.
************************
Outfall Loading Summary
***********************
-------------------------------------------------------------
                Flow     Avg.     Max.    Total
                Freq.    Flow     Flow   Volume
```

```
Outfall Node          Pcnt.      CMS       CMS    10^6 ltr
-------------------------------------------------------------
J13                  2.82     0.005     0.023       0.011
-------------------------------------------------------------
System               2.82     0.005     0.023       0.011
********************
Link Flow Summary
********************
-------------------------------------------------------------------------------
                          Maximum  Time of Max   Maximum    Max/    Max/
                           |Flow|   Occurrence   |Veloc|    Full    Full
Link                Type       CMS  days hr:min     m/sec    Flow   Depth
-------------------------------------------------------------------------------
C16                 CONDUIT    0.023    0  00:08      0.79    0.75    0.44
C17                 CONDUIT    0.017    0  00:08      0.51    0.56    0.49
C20                 CONDUIT    0.006    0  00:08      0.20    0.19    0.47
C27                 CONDUIT    0.012    0  00:08      0.34    0.37    0.49
***************************
Flow Classification Summary
***************************
-----------------------------------------------------------------------------------------
                 Adjusted    --- Fraction of Time in Flow Class ----   Avg.     Avg.
                  /Actual       Up   Down  Sub   Sup   Up    Down   Froude   Flow
Conduit            Length    Dry  Dry   Dry   Crit  Crit  Crit  Crit   Number   Change
-----------------------------------------------------------------------------------------
C16                 1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.05   0.0000
C17                 1.00   0.00  0.19  0.00  0.81  0.00  0.00  0.00     0.02   0.0000
C20                 1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.01   0.0000
C27                 1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.02   0.0000
*************************
Conduit Surcharge Summary
*************************
No conduits were surcharged.
```

- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.001        46.400
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.001        45.514
```

```
Final Surface Storage ....        0.000        0.953
Continuity Error (%) .....        0.000
**************************       Volume       Volume
Flow Routing Continuity       hectare-m      10^6 ltr
**************************    ---------    ---------
Dry Weather Inflow .......        0.000        0.000
Wet Weather Inflow .......        0.001        0.015
Groundwater Inflow .......        0.000        0.000
RDII Inflow ..............        0.000        0.000
External Inflow ..........        0.000        0.000
External Outflow .........        0.001        0.015
Internal Outflow .........        0.000        0.000
Storage Losses ...........        0.000        0.000
Initial Stored Volume ....        0.000        0.000
Final Stored Volume ......        0.000        0.000
Continuity Error (%) .....        0.000
**************************

Time-Step Critical Elements
***************************

None
********************************

Highest Flow Instability Indexes
********************************

All links are stable.
************************

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

Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
**************************

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

-------------------------------------------------------------------------------------------------
                  Total     Total     Total     Total     Total     Total    Peak  Runoff
                  Precip    Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
Subcatchment          mm        mm        mm        mm        mm    10^6 ltr     CMS
-------------------------------------------------------------------------------------------------
S12                46.40      0.00      0.00      0.00     45.51      0.00     0.01   0.981
S13                46.40      0.00      0.00      0.00     45.51      0.00     0.01   0.981
S15                46.40      0.00      0.00      0.00     45.51      0.00     0.01   0.981
S16                46.40      0.00      0.00      0.00     45.51      0.00     0.01   0.981
******************

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

-------------------------------------------------------------------
                     Average  Maximum  Maximum  Time of Max
                       Depth    Depth      HGL   Occurrence
Node          Type      Meters   Meters   Meters  days hr:min
-------------------------------------------------------------------
J14          JUNCTION     0.00     0.17     0.18     0  00:08
J15          JUNCTION     0.00     0.17     0.19     0  00:08
J17          JUNCTION     0.00     0.17     0.20     0  00:08
J18          JUNCTION     0.00     0.16     0.20     0  00:08
J13          OUTFALL      0.00     0.13     0.13     0  00:08
*******************

Node Inflow Summary
*******************

-----------------------------------------------------------------------------------------
                     Maximum  Maximum                Lateral      Total
                     Lateral    Total  Time of Max     Inflow     Inflow
                      Inflow   Inflow   Occurrence     Volume     Volume
Node          Type       CMS      CMS  days hr:min    10^6 ltr   10^6 ltr
-----------------------------------------------------------------------------------------
J14          JUNCTION    0.008    0.031     0  00:08      0.004      0.015
J15          JUNCTION    0.008    0.024     0  00:08      0.004      0.011
J17          JUNCTION    0.008    0.016     0  00:08      0.004      0.007
J18          JUNCTION    0.008    0.008     0  00:08      0.004      0.004
J13          OUTFALL     0.000    0.031     0  00:08      0.000      0.015
**********************

Node Surcharge Summary
```

```
**********************
No nodes were surcharged.
**********************
Node Flooding Summary
**********************
No nodes were flooded.
***********************
Outfall Loading Summary
***********************
-------------------------------------------------------------
                  Flow     Avg.     Max.     Total
                  Freq.    Flow     Flow     Volume
Outfall Node       Pcnt.    CMS      CMS    10^6 ltr
-------------------------------------------------------------
J13                2.86    0.006    0.031     0.015
-------------------------------------------------------------
System             2.86    0.006    0.031     0.015
********************
Link Flow Summary
********************
-----------------------------------------------------------------------------
                        Maximum  Time of Max  Maximum    Max/    Max/
                        |Flow|   Occurrence  |Veloc|    Full    Full
Link          Type        CMS  days hr:min    m/sec    Flow   Depth
-----------------------------------------------------------------------------
C16          CONDUIT     0.031    0  00:08     0.88    0.99    0.51
C17          CONDUIT     0.023    0  00:08     0.57    0.74    0.57
C20          CONDUIT     0.008    0  00:08     0.21    0.25    0.55
C27          CONDUIT     0.015    0  00:08     0.38    0.50    0.57
****************************
Flow Classification Summary
****************************
-------------------------------------------------------------------------------------
              Adjusted    --- Fraction of Time in Flow Class ----   Avg.     Avg.
              /Actual       Up   Down  Sub   Sup   Up    Down   Froude   Flow
Conduit         Length     Dry  Dry   Dry   Crit  Crit  Crit   Crit   Number   Change
-------------------------------------------------------------------------------------
C16             1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.05   0.0000
C17             1.00   0.00  0.20  0.00  0.80  0.00  0.00  0.00     0.02   0.0000
C20             1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.01   0.0000
C27             1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.02   0.0000
************************
Conduit Surcharge Summary
************************
No conduits were surcharged.
```

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
```

```
Antecedent Dry Days ..... 0.0
Report Time Step ..... 00:00:30
Wet Time Step ..... 00:00:05
Dry Time Step ..... 00:00:30
Routing Time Step ..... 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.002        58.590
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.000         0.000
Surface Runoff ...........        0.002        57.638
Final Surface Storage ....        0.000         0.953
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.002         0.018
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.002         0.018
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.000         0.000
Continuity Error (%) .....        0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
***************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------------
                    Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip     Runon      Evap     Infil    Runoff    Runoff   Runoff   Coeff
Subcatchment           mm        mm        mm        mm        mm    10^6 ltr      CMS
-----------------------------------------------------------------------------------------------------
S12                 58.59      0.00      0.00      0.00     57.64      0.00     0.01   0.984
S13                 58.59      0.00      0.00      0.00     57.64      0.00     0.01   0.984
S15                 58.59      0.00      0.00      0.00     57.64      0.00     0.01   0.984
S16                 58.59      0.00      0.00      0.00     57.64      0.00     0.01   0.984
******************
Node Depth Summary
******************
-----------------------------------------------------------------------
                         Average  Maximum  Maximum  Time of Max
                           Depth    Depth      HGL   Occurrence
Node          Type        Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------------
J14          JUNCTION      0.00     0.13     0.14     0  00:17
J15          JUNCTION      0.00     0.14     0.16     0  00:17
J17          JUNCTION      0.00     0.13     0.16     0  00:17
J18          JUNCTION      0.00     0.12     0.16     0  00:17
J13          OUTFALL       0.00     0.11     0.11     0  00:17
******************
Node Inflow Summary
******************
-----------------------------------------------------------------------------------------------
```

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J14	JUNCTION	0.005	0.020	0 00:16	0.005	0.018
J15	JUNCTION	0.005	0.015	0 00:16	0.005	0.014
J17	JUNCTION	0.005	0.010	0 00:16	0.005	0.009
J18	JUNCTION	0.005	0.005	0 00:16	0.005	0.005
J13	OUTFALL	0.000	0.020	0 00:17	0.000	0.018

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
J13	3.78	0.006	0.020	0.018
System	3.78	0.006	0.020	0.018

****
Link Flow Summary
****

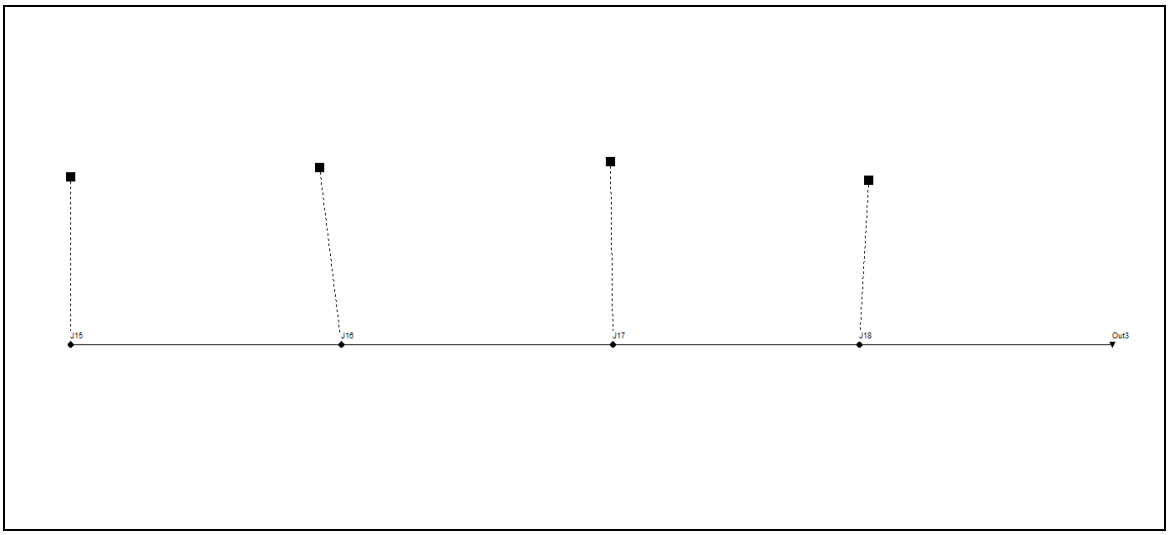
Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C16	CONDUIT	0.020	0 00:17	0.76	0.65	0.41
C17	CONDUIT	0.015	0 00:17	0.49	0.48	0.46
C20	CONDUIT	0.005	0 00:17	0.17	0.16	0.43
C27	CONDUIT	0.010	0 00:17	0.33	0.32	0.46

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
C17	1.00	0.00	0.18	0.00	0.82	0.00	0.00	0.02	0.0000
C20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01	0.0000
C27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.02	0.0000

****
Conduit Surcharge Summary
****
No conduits were surcharged.

VERIFICA COLLETTORI – PONTE SUL TORRENTE QUARESIMO



- Durata 15' – T_R25anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.002        35.438
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.000         0.419
Surface Runoff ...........         0.002        34.095
Final Surface Storage ....         0.000         0.957
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.002         0.018
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

```
External Inflow .........      0.000      0.000
External Outflow .........     0.002      0.018
Internal Outflow .........    0.000      0.000
Storage Losses ...........     0.000      0.000
Initial Stored Volume ....     0.000      0.000
Final Stored Volume ......     0.000      0.000
Continuity Error (%) .....     0.000
**************************
Time-Step Critical Elements
**************************
None
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :    1.00 sec
Average Time Step          :    1.00 sec
Maximum Time Step          :    1.00 sec
Percent in Steady State    :    0.00
Average Iterations per Step :   2.00
**************************
Subcatchment Runoff Summary
**************************
-------------------------------------------------------------------------------------------------
                   Total     Total     Total     Total     Total     Total     Peak  Runoff
                  Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
Subcatchment          mm        mm        mm        mm        mm    10^6 ltr      CMS
-------------------------------------------------------------------------------------------------
S13                35.44      0.00      0.00      0.00     34.52      0.01     0.01   0.974
S14                35.44      0.00      0.00      0.00     34.52      0.01     0.01   0.974
S15                35.44      0.00      0.00      0.00     34.52      0.01     0.01   0.974
S16                35.44      0.00      0.00      3.11     31.38      0.00     0.00   0.885
******************
Node Depth Summary
******************
-----------------------------------------------------------------------
                      Average  Maximum  Maximum  Time of Max
                        Depth    Depth      HGL   Occurrence
Node          Type       Meters   Meters   Meters  days hr:min
-----------------------------------------------------------------------
J15          JUNCTION     0.00     0.15     0.18     0  00:08
J16          JUNCTION     0.00     0.16     0.18     0  00:08
J17          JUNCTION     0.00     0.16     0.17     0  00:08
J18          JUNCTION     0.00     0.15     0.15     0  00:08
Out3          OUTFALL     0.00     0.14     0.14     0  00:08
*******************
Node Inflow Summary
*******************
-------------------------------------------------------------------------------------
                      Maximum  Maximum                Lateral      Total
                      Lateral    Total  Time of Max     Inflow     Inflow
                       Inflow   Inflow   Occurrence     Volume     Volume
Node          Type        CMS      CMS  days hr:min    10^6 ltr   10^6 ltr
-------------------------------------------------------------------------------------
J15          JUNCTION    0.012    0.012     0  00:08      0.005      0.005
J16          JUNCTION    0.012    0.023     0  00:08      0.005      0.010
J17          JUNCTION    0.012    0.034     0  00:08      0.005      0.016
J18          JUNCTION    0.005    0.038     0  00:08      0.002      0.018
Out3          OUTFALL    0.000    0.038     0  00:08      0.000      0.018
**********************
Node Surcharge Summary
**********************
No nodes were surcharged.
*********************
Node Flooding Summary
*********************
No nodes were flooded.
**********************
Outfall Loading Summary
**********************
```

```
-------------------------------------------------------------
                  Flow     Avg.    Max.     Total
                  Freq.    Flow    Flow     Volume
Outfall Node       Pcnt.    CMS     CMS    10^6 ltr
-------------------------------------------------------------
Out3               2.88    0.007   0.038    0.018
-------------------------------------------------------------
System             2.88    0.007   0.038    0.018
********************
Link Flow Summary
********************
-----------------------------------------------------------------------------
                        Maximum  Time of Max  Maximum   Max/   Max/
                        |Flow|   Occurrence  |Veloc|   Full   Full
Link            Type      CMS   days hr:min   m/sec   Flow   Depth
-----------------------------------------------------------------------------
C18             CONDUIT   0.011   0  00:08    0.27    0.15   0.40
C19             CONDUIT   0.022   0  00:08    0.51    0.30   0.42
C20             CONDUIT   0.033   0  00:08    0.78    0.46   0.41
C21             CONDUIT   0.038   0  00:08    0.97    0.52   0.38
***************************
Flow Classification Summary
***************************
-----------------------------------------------------------------------------------------
              Adjusted   --- Fraction of Time in Flow Class ----   Avg.    Avg.
               /Actual     Up   Down  Sub   Sup   Up    Down   Froude   Flow
Conduit         Length    Dry  Dry   Dry   Crit  Crit  Crit   Crit   Number   Change
-----------------------------------------------------------------------------------------
C18              1.00    0.00  0.03  0.00  0.97  0.00  0.00   0.00    0.02    0.0000
C19              1.00    0.00  0.00  0.00  1.00  0.00  0.00   0.00    0.03    0.0000
C20              1.00    0.00  0.21  0.00  0.79  0.00  0.00   0.00    0.04    0.0000
C21              1.00    0.00  0.00  0.00  0.99  0.01  0.00   0.00    0.06    0.0000
*************************
Conduit Surcharge Summary
*************************
No conduits were surcharged.
```

- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
**************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
**************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 23:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m          mm
**************************     ---------       -------
Total Precipitation ......        0.002        46.400
```

```
  Evaporation Loss .........        0.000        0.000
  Infiltration Loss ........       0.000        0.498
  Surface Runoff ...........       0.002       44.992
  Final Surface Storage ....       0.000        0.957
  Continuity Error (%) .....       0.000
  **************************      Volume       Volume
  Flow Routing Continuity       hectare-m      10^6 ltr
  **************************    ---------    ---------
  Dry Weather Inflow .......       0.000        0.000
  Wet Weather Inflow .......       0.002        0.023
  Groundwater Inflow .......       0.000        0.000
  RDII Inflow ..............       0.000        0.000
  External Inflow ..........       0.000        0.000
  External Outflow .........       0.002        0.023
  Internal Outflow .........       0.000        0.000
  Storage Losses ...........       0.000        0.000
  Initial Stored Volume ....       0.000        0.000
  Final Stored Volume ......       0.000        0.000
  Continuity Error (%) .....       0.000
  ***************************
  Time-Step Critical Elements
  ***************************
  None
  ********************************
  Highest Flow Instability Indexes
  ********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step          :     1.00 sec
  Average Time Step          :     1.00 sec
  Maximum Time Step          :     1.00 sec
  Percent in Steady State    :     0.00
  Average Iterations per Step :    2.00
  ****************************
  Subcatchment Runoff Summary
  ***************************
  ---------------------------------------------------------------------------------------------------
                      Total     Total     Total     Total     Total     Total    Peak  Runoff
                     Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
  Subcatchment          mm        mm        mm        mm        mm        mm   10^6 ltr     CMS
  ---------------------------------------------------------------------------------------------------
  S13                 46.40      0.00      0.00      0.00     45.49      0.01     0.02   0.980
  S14                 46.40      0.00      0.00      0.00     45.49      0.01     0.02   0.980
  S15                 46.40      0.00      0.00      0.00     45.49      0.01     0.02   0.980
  S16                 46.40      0.00      0.00      3.70     41.77      0.00     0.01   0.900
  ******************
  Node Depth Summary
  ******************
  ---------------------------------------------------------------------
                          Average  Maximum  Maximum  Time of Max
                            Depth    Depth      HGL   Occurrence
  Node          Type        Meters   Meters   Meters  days hr:min
  ---------------------------------------------------------------------
  J15         JUNCTION       0.00     0.17     0.21     0  00:08
  J16         JUNCTION       0.01     0.20     0.21     0  00:08
  J17         JUNCTION       0.01     0.20     0.20     0  00:08
  J18         JUNCTION       0.00     0.17     0.18     0  00:08
  Out3         OUTFALL       0.00     0.16     0.16     0  00:08
  *******************
  Node Inflow Summary
  *******************
  -------------------------------------------------------------------------------------
                          Maximum  Maximum                 Lateral      Total
                          Lateral    Total  Time of Max     Inflow     Inflow
                           Inflow   Inflow   Occurrence     Volume     Volume
  Node          Type          CMS      CMS  days hr:min    10^6 ltr   10^6 ltr
  -------------------------------------------------------------------------------------
  J15         JUNCTION      0.015    0.015     0  00:08      0.007      0.007
  J16         JUNCTION      0.015    0.030     0  00:08      0.007      0.014
  J17         JUNCTION      0.015    0.045     0  00:08      0.007      0.020
  J18         JUNCTION      0.006    0.050     0  00:08      0.003      0.023
```

```
Out3              OUTFALL      0.000    0.050     0  00:08       0.000       0.023
**********************
Node Surcharge Summary
**********************
No nodes were surcharged.
*********************
Node Flooding Summary
*********************
No nodes were flooded.
**********************
Outfall Loading Summary
**********************
-------------------------------------------------------------
                  Flow      Avg.      Max.       Total
                  Freq.     Flow      Flow      Volume
Outfall Node       Pcnt.      CMS       CMS    10^6 ltr
-------------------------------------------------------------
Out3                3.11     0.009     0.050       0.023
-------------------------------------------------------------
System              3.11     0.009     0.050       0.023
********************
Link Flow Summary
********************
-----------------------------------------------------------------------------
                         Maximum  Time of Max   Maximum    Max/    Max/
                          |Flow|   Occurrence   |Veloc|    Full    Full
Link              Type        CMS  days hr:min     m/sec    Flow   Depth
-----------------------------------------------------------------------------
C18              CONDUIT     0.015     0  00:08      0.32    0.11    0.50
C19              CONDUIT     0.029     0  00:08      0.49    1.27    0.54
C20              CONDUIT     0.044     0  00:08      0.81    1.02    0.49
C21              CONDUIT     0.050     0  00:08      1.06    0.69    0.44
***************************
Flow Classification Summary
***************************
-------------------------------------------------------------------------------------
                 Adjusted    --- Fraction of Time in Flow Class ----   Avg.     Avg.
                  /Actual        Up   Down  Sub   Sup   Up    Down   Froude   Flow
Conduit            Length    Dry  Dry   Dry   Crit  Crit  Crit  Crit   Number   Change
-------------------------------------------------------------------------------------
C18                 1.00   0.00  0.78  0.00  0.22  0.00  0.00  0.00     0.01   0.0000
C19                 1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.01   0.0000
C20                 1.00   0.00  0.00  0.00  1.00  0.00  0.00  0.00     0.02   0.0000
C21                 1.00   0.00  0.00  0.00  0.99  0.01  0.00  0.00     0.09   0.0000
*************************
Conduit Surcharge Summary
*************************
-----------------------------------------------------------------------------
                                                  Hours       Hours
                  --------- Hours Full --------   Above Full   Capacity
Conduit             Both Ends  Upstream  Dnstream   Normal Flow   Limited
-----------------------------------------------------------------------------
C19                    0.01      0.01      0.01      0.06         0.01
C20                    0.01      0.01      0.01      0.01         0.01
```

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... CMS
```

```
  Process Models:
    Rainfall/Runoff ........ YES
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ YES
    Water Quality .......... NO
  Infiltration Method ...... CURVE_NUMBER
  Flow Routing Method ...... DYNWAVE
  Starting Date ............ FEB-14-2012 00:00:00
  Ending Date .............. FEB-14-2012 23:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:00:30
  Wet Time Step ............ 00:00:05
  Dry Time Step ............ 00:00:30
  Routing Time Step ........ 1.00 sec
  **************************       Volume         Depth
  Runoff Quantity Continuity     hectare-m           mm
  **************************    ---------       -------
  Total Precipitation ......         0.003        58.590
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.000         0.570
  Surface Runoff ...........         0.003        57.064
  Final Surface Storage ....         0.000         0.957
  Continuity Error (%) .....         0.000
  **************************       Volume       Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************    ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.003         0.030
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         0.000         0.000
  External Outflow .........         0.003         0.030
  Internal Outflow .........         0.000         0.000
  Storage Losses ...........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.000         0.000
  Continuity Error (%) .....         0.000
  **************************
  Time-Step Critical Elements
  **************************
  None
  ********************************
  Highest Flow Instability Indexes
  ********************************
  All links are stable.
  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     1.00 sec
  Average Time Step           :     1.00 sec
  Maximum Time Step           :     1.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.00
  **************************
  Subcatchment Runoff Summary
  **************************
  ---------------------------------------------------------------------------------------------
                      Total     Total     Total     Total     Total     Total     Peak  Runoff
                     Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
  Subcatchment           mm        mm        mm        mm        mm    10^6 ltr      CMS
  ---------------------------------------------------------------------------------------------
  S13                  58.59      0.00      0.00      0.00     57.64      0.01     0.01   0.984
  S14                  58.59      0.00      0.00      0.00     57.64      0.01     0.01   0.984
  S15                  58.59      0.00      0.00      0.00     57.64      0.01     0.01   0.984
  S16                  58.59      0.00      0.00      4.23     53.37      0.00     0.00   0.911
  *****************
  Node Depth Summary
  *****************
  -----------------------------------------------------------------------
                        Average  Maximum  Maximum  Time of Max
                          Depth    Depth      HGL   Occurrence
```

Node	Type	Meters	Meters	Meters	days	hr:min
J15	JUNCTION	0.00	0.13	0.17	0	00:17
J16	JUNCTION	0.00	0.14	0.17	0	00:17
J17	JUNCTION	0.00	0.15	0.16	0	00:17
J18	JUNCTION	0.00	0.14	0.14	0	00:17
Out3	OUTFALL	0.00	0.13	0.13	0	00:17

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J15	JUNCTION	0.009	0.009	0	00:16	0.009	0.009
J16	JUNCTION	0.009	0.019	0	00:16	0.009	0.017
J17	JUNCTION	0.009	0.028	0	00:16	0.009	0.026
J18	JUNCTION	0.004	0.032	0	00:17	0.004	0.030
Out3	OUTFALL	0.000	0.032	0	00:17	0.000	0.030

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
Out3	3.83	0.009	0.032	0.030
System	3.83	0.009	0.032	0.030

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C18	CONDUIT	0.009	0	00:17	0.26	0.13	0.37
C19	CONDUIT	0.019	0	00:17	0.48	0.26	0.38
C20	CONDUIT	0.028	0	00:17	0.74	0.39	0.38
C21	CONDUIT	0.032	0	00:17	0.92	0.44	0.35

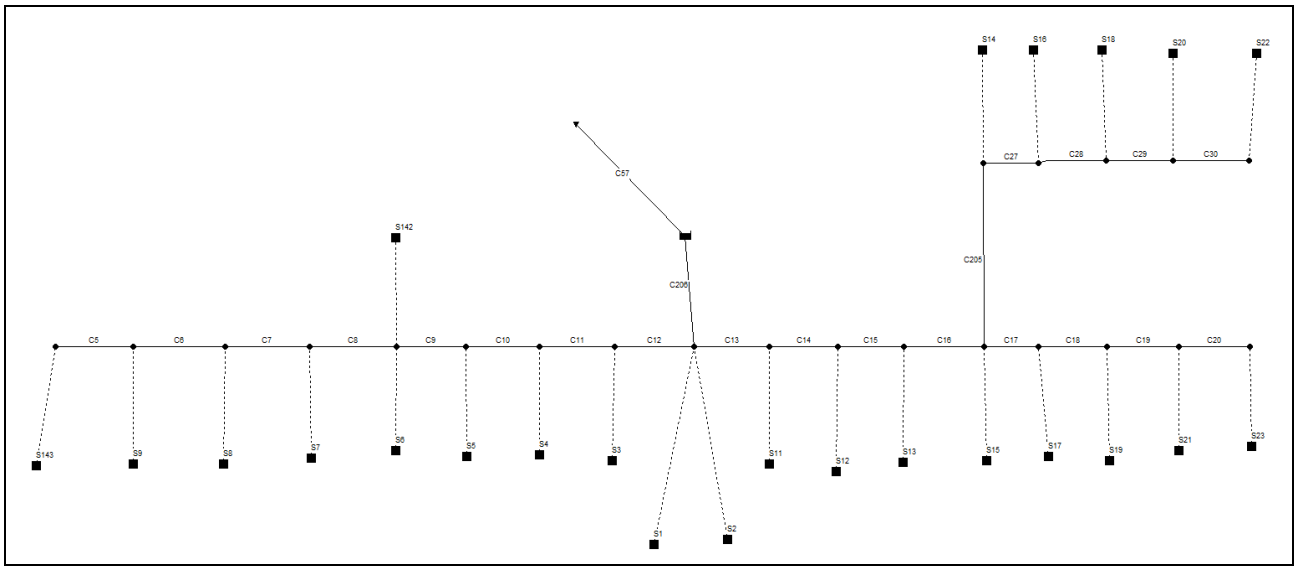
****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C18	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.02	0.0000
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.04	0.0000
C20	1.00	0.00	0.22	0.00	0.78	0.00	0.00	0.04	0.0000
C21	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.07	0.0000

****
Conduit Surcharge Summary
****
No conduits were surcharged.

ALLEGATO 6: RISULTATI DIMENSIONAMENTO SISTEMI DI RACCOLTA NELLA TRINCEA E NEI SOTTOVIA

ST01 – SOTTOPASSO DI RETE 2



- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.033        46.400
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.002         2.452
Surface Runoff ...........        0.030        42.742
Final Surface Storage ....        0.001         1.270
Continuity Error (%) .....       -0.140
*************************        Volume        Volume
Flow Routing Continuity       hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
```

```
Wet Weather Inflow .......        0.030        0.300
Groundwater Inflow .......        0.000        0.000
RDII Inflow ..............      0.000        0.000
External Inflow ..........       0.000        0.000
External Outflow .........       0.017        0.172
Internal Outflow .........       0.000        0.000
Storage Losses ...........       0.000        0.000
Initial Stored Volume ....       0.000        0.000
Final Stored Volume ......       0.013        0.128
Continuity Error (%) .....       0.000
**************************
Time-Step Critical Elements
**************************
Link C57 (97.47%)
*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step          :     0.50 sec
Average Time Step          :     0.51 sec
Maximum Time Step          :     1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S3	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S2	46.40	0.00	0.00	2.45	42.74	0.01	28.49	0.921
S11	46.40	0.00	0.00	2.45	42.74	0.01	28.49	0.921
S12	46.40	0.00	0.00	2.45	42.74	0.01	28.49	0.921
S13	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S17	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S19	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S21	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S23	46.40	0.00	0.00	2.46	42.73	0.01	32.46	0.921
S6	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S5	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S4	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S15	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S14	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S16	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S18	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S20	46.40	0.00	0.00	2.45	42.75	0.01	17.83	0.921
S22	46.40	0.00	0.00	2.46	42.73	0.01	32.46	0.921
S7	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S8	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S9	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S1	46.40	0.00	0.00	2.45	42.74	0.01	35.61	0.921
S142	46.40	0.00	0.00	2.44	42.83	0.01	21.98	0.923
S143	46.40	0.00	0.00	2.46	42.73	0.03	79.01	0.921

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.01	0.15	46.19	0 00:08
J24	JUNCTION	0.01	0.17	46.07	0 00:08
J23	JUNCTION	0.01	0.16	45.81	0 00:08
J22	JUNCTION	0.01	0.16	45.28	0 00:08
J21	JUNCTION	0.02	0.22	44.61	0 00:09
J19	JUNCTION	0.02	0.24	43.90	0 00:09
J18	JUNCTION	0.02	0.29	43.41	0 00:09
J17	JUNCTION	0.03	0.48	43.26	0 00:09
J15	JUNCTION	0.05	0.55	43.22	0 00:09

J13	JUNCTION	0.03	0.45	43.29	0	00:09
J12	JUNCTION	0.02	0.30	43.66	0	00:09
J11	JUNCTION	0.02	0.26	44.34	0	00:09
J10	JUNCTION	0.02	0.25	44.99	0	00:08
J173	JUNCTION	0.03	0.32	44.71	0	00:09
J176	JUNCTION	0.01	0.16	45.28	0	00:08
J177	JUNCTION	0.01	0.16	45.81	0	00:08
J178	JUNCTION	0.01	0.17	46.07	0	00:08
J179	JUNCTION	0.01	0.15	46.19	0	00:08
J187	JUNCTION	0.02	0.29	45.56	0	00:08
J188	JUNCTION	0.02	0.28	45.96	0	00:08
J189	JUNCTION	0.02	0.27	46.23	0	00:08
J190	JUNCTION	0.02	0.26	46.37	0	00:08
Out3	OUTFALL	0.09	0.09	40.26	0	00:06
1	STORAGE	0.70	0.97	41.14	0	00:20

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	32.46	32.46	0 00:08	0.014	0.014
J24	JUNCTION	17.83	49.76	0 00:08	0.007	0.021
J23	JUNCTION	17.83	66.01	0 00:08	0.007	0.029
J22	JUNCTION	17.83	81.95	0 00:08	0.007	0.036
J21	JUNCTION	17.83	192.13	0 00:08	0.007	0.087
J19	JUNCTION	35.61	223.81	0 00:09	0.015	0.102
J18	JUNCTION	28.49	249.07	0 00:09	0.012	0.114
J17	JUNCTION	28.49	274.07	0 00:09	0.012	0.126
J15	JUNCTION	64.10	651.07	0 00:09	0.027	0.300
J13	JUNCTION	35.61	322.68	0 00:08	0.015	0.147
J12	JUNCTION	35.61	292.98	0 00:08	0.015	0.132
J11	JUNCTION	35.61	262.10	0 00:08	0.015	0.117
J10	JUNCTION	57.59	230.15	0 00:08	0.024	0.102
J173	JUNCTION	17.83	97.58	0 00:08	0.007	0.044
J176	JUNCTION	17.83	81.95	0 00:08	0.007	0.036
J177	JUNCTION	17.83	66.01	0 00:08	0.007	0.029
J178	JUNCTION	17.83	49.76	0 00:08	0.007	0.021
J179	JUNCTION	32.46	32.46	0 00:08	0.014	0.014
J187	JUNCTION	35.61	177.93	0 00:08	0.015	0.078
J188	JUNCTION	35.61	146.63	0 00:08	0.015	0.063
J189	JUNCTION	35.61	113.81	0 00:08	0.015	0.048
J190	JUNCTION	79.01	79.01	0 00:08	0.033	0.033
Out3	OUTFALL	0.00	20.00	0 00:06	0.000	0.172
1	STORAGE	0.00	650.77	0 00:09	0.000	0.300

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.200	28	0	0.278	39	0 00:20	20.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	98.26	19.87	20.00	0.172

System 98.26 19.87 20.00 0.172
****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	20.00	0 00:06	0.73	0.47	0.59
C12	CONDUIT	320.49	0 00:09	1.08	0.65	0.72
C13	CONDUIT	274.08	0 00:09	0.90	0.61	0.74
C14	CONDUIT	248.62	0 00:09	1.29	0.48	0.65
C15	CONDUIT	223.33	0 00:09	1.84	0.34	0.44
C16	CONDUIT	191.34	0 00:09	1.93	0.28	0.38
C17	CONDUIT	79.97	0 00:08	1.37	0.35	0.47
C18	CONDUIT	64.37	0 00:08	1.37	0.33	0.40
C19	CONDUIT	48.40	0 00:08	1.02	0.36	0.40
C20	CONDUIT	31.94	0 00:08	0.68	0.32	0.40
C9	CONDUIT	227.14	0 00:08	2.03	0.35	0.42
C10	CONDUIT	258.24	0 00:09	2.01	0.38	0.47
C11	CONDUIT	289.88	0 00:09	1.57	0.50	0.63
C30	CONDUIT	31.94	0 00:08	0.68	0.32	0.40
C29	CONDUIT	48.40	0 00:08	1.02	0.36	0.40
C28	CONDUIT	64.37	0 00:08	1.37	0.33	0.40
C27	CONDUIT	79.98	0 00:08	1.02	0.35	0.60
C5	CONDUIT	78.21	0 00:08	0.90	0.75	0.65
C6	CONDUIT	111.33	0 00:08	1.23	0.78	0.68
C7	CONDUIT	143.36	0 00:08	1.49	0.83	0.71
C8	CONDUIT	174.45	0 00:08	1.95	0.88	0.67
C205	CONDUIT	95.74	0 00:09	1.07	12.81	0.67
C206	CONDUIT	650.77	0 00:09	2.08	10.72	0.76

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.12	0.0000
C12	1.00	0.01	0.24	0.00	0.75	0.00	0.00	0.13	0.0001
C13	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.16	0.0001
C14	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.50	0.0001
C15	1.00	0.01	0.00	0.00	0.83	0.16	0.00	0.71	0.0000
C16	1.00	0.01	0.00	0.00	0.77	0.22	0.00	0.79	0.0000
C17	1.00	0.01	0.08	0.00	0.84	0.08	0.00	0.33	0.0000
C18	1.00	0.01	0.00	0.00	0.88	0.11	0.00	0.40	0.0000
C19	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.28	0.0000
C20	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.16	0.0000
C9	1.00	0.01	0.00	0.00	0.81	0.18	0.00	0.53	0.0000
C10	1.00	0.01	0.00	0.00	0.82	0.17	0.00	0.51	0.0000
C11	1.00	0.01	0.00	0.00	0.97	0.02	0.00	0.38	0.0001
C30	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.16	0.0000
C29	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.28	0.0000
C28	1.00	0.01	0.00	0.00	0.88	0.11	0.00	0.39	0.0000
C27	1.00	0.01	0.35	0.00	0.64	0.00	0.00	0.12	0.0000
C5	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.19	0.0001
C6	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.29	0.0001
C7	1.00	0.01	0.00	0.00	0.93	0.06	0.00	0.37	0.0001
C8	1.00	0.01	0.00	0.00	0.77	0.22	0.00	0.54	0.0001
C205	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.21	0.0015
C206	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.41	0.0012

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C205	0.01	0.01	0.01	0.22	0.01
C206	0.01	0.01	0.01	0.22	0.01

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.041        58.590
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.002         2.470
Surface Runoff ...........        0.039        54.851
Final Surface Storage ....        0.001         1.270
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.039         0.385
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.017         0.167
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.022         0.218
Continuity Error (%) .....        0.016
***************************
Time-Step Critical Elements
***************************
Link C57 (96.60%)
*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.52 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
****************************
Subcatchment Runoff Summary
****************************
-----------------------------------------------------------------------------------------------
                    Total      Total      Total      Total      Total      Total     Peak  Runoff
                   Precip      Runon       Evap       Infil     Runoff     Runoff   Runoff   Coeff
Subcatchment           mm         mm         mm         mm         mm    10^6 ltr      LPS
```

S3	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S2	58.59	0.00	0.00	2.47	54.85	0.02	17.52	0.936
S11	58.59	0.00	0.00	2.47	54.85	0.02	17.52	0.936
S12	58.59	0.00	0.00	2.47	54.85	0.02	17.52	0.936
S13	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S17	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S19	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S21	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S23	58.59	0.00	0.00	2.47	54.85	0.02	20.01	0.936
S6	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S5	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S4	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S15	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S14	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S16	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S18	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S20	58.59	0.00	0.00	2.47	54.85	0.01	10.95	0.936
S22	58.59	0.00	0.00	2.47	54.85	0.02	20.01	0.936
S7	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S8	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S9	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S1	58.59	0.00	0.00	2.47	54.85	0.02	21.90	0.936
S142	58.59	0.00	0.00	2.46	54.86	0.01	13.46	0.936
S143	58.59	0.00	0.00	2.47	54.85	0.04	48.77	0.936

****

Node Depth Summary

****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.02	0.12	46.16	0 00:17
J24	JUNCTION	0.02	0.13	46.03	0 00:17
J23	JUNCTION	0.02	0.12	45.77	0 00:17
J22	JUNCTION	0.02	0.13	45.25	0 00:17
J21	JUNCTION	0.03	0.17	44.56	0 00:17
J19	JUNCTION	0.03	0.19	43.85	0 00:17
J18	JUNCTION	0.03	0.23	43.35	0 00:17
J17	JUNCTION	0.05	0.37	43.15	0 00:17
J15	JUNCTION	0.07	0.45	43.12	0 00:17
J13	JUNCTION	0.04	0.33	43.17	0 00:17
J12	JUNCTION	0.03	0.24	43.60	0 00:17
J11	JUNCTION	0.03	0.20	44.28	0 00:17
J10	JUNCTION	0.03	0.20	44.94	0 00:17
J173	JUNCTION	0.04	0.26	44.65	0 00:17
J176	JUNCTION	0.02	0.13	45.25	0 00:17
J177	JUNCTION	0.02	0.12	45.77	0 00:17
J178	JUNCTION	0.02	0.13	46.03	0 00:17
J179	JUNCTION	0.02	0.12	46.16	0 00:17
J187	JUNCTION	0.03	0.22	45.49	0 00:17
J188	JUNCTION	0.03	0.21	45.89	0 00:17
J189	JUNCTION	0.03	0.20	46.16	0 00:17
J190	JUNCTION	0.02	0.19	46.30	0 00:17
Out3	OUTFALL	0.09	0.09	40.26	0 00:11
1	STORAGE	0.94	1.23	41.40	0 00:34

****

Node Inflow Summary

****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	20.01	20.01	0 00:17	0.018	0.018
J24	JUNCTION	10.95	30.93	0 00:17	0.010	0.027
J23	JUNCTION	10.95	41.77	0 00:17	0.010	0.037
J22	JUNCTION	10.95	52.55	0 00:17	0.010	0.046
J21	JUNCTION	10.95	126.17	0 00:17	0.010	0.112
J19	JUNCTION	21.90	147.47	0 00:17	0.019	0.131
J18	JUNCTION	17.52	164.37	0 00:17	0.015	0.146
J17	JUNCTION	17.52	181.14	0 00:17	0.015	0.162
J15	JUNCTION	39.42	430.44	0 00:17	0.035	0.385

J13	JUNCTION	21.90	212.93	0	00:17	0.019	0.189
J12	JUNCTION	21.90	191.81	0	00:17	0.019	0.170
J11	JUNCTION	21.90	170.44	0	00:17	0.019	0.151
J10	JUNCTION	35.36	148.91	0	00:17	0.031	0.131
J173	JUNCTION	10.95	63.27	0	00:17	0.010	0.056
J176	JUNCTION	10.95	52.55	0	00:17	0.010	0.046
J177	JUNCTION	10.95	41.77	0	00:17	0.010	0.037
J178	JUNCTION	10.95	30.93	0	00:17	0.010	0.027
J179	JUNCTION	20.01	20.01	0	00:17	0.018	0.018
J187	JUNCTION	21.90	113.92	0	00:17	0.019	0.100
J188	JUNCTION	21.90	92.32	0	00:17	0.019	0.081
J189	JUNCTION	21.90	70.61	0	00:17	0.019	0.062
J190	JUNCTION	48.77	48.77	0	00:17	0.043	0.043
Out3	OUTFALL	0.00	20.00	0	00:11	0.000	0.167
1	STORAGE	0.00	430.23	0	00:17	0.000	0.385

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.267	37	0	0.351	49	0 00:34	20.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	97.11	19.81	20.00	0.167
System	97.11	19.81	20.00	0.167

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	20.00	0 00:11	0.74	0.47	0.59
C12	CONDUIT	212.11	0 00:17	0.96	0.43	0.56
C13	CONDUIT	180.75	0 00:17	0.78	0.40	0.58
C14	CONDUIT	164.10	0 00:17	1.17	0.32	0.50
C15	CONDUIT	147.19	0 00:17	1.64	0.22	0.35
C16	CONDUIT	125.95	0 00:17	1.71	0.18	0.31
C17	CONDUIT	52.37	0 00:17	1.20	0.23	0.38
C18	CONDUIT	41.63	0 00:17	1.21	0.21	0.32
C19	CONDUIT	30.84	0 00:17	0.89	0.23	0.32
C20	CONDUIT	19.98	0 00:17	0.59	0.20	0.31
C9	CONDUIT	148.61	0 00:17	1.80	0.23	0.33
C10	CONDUIT	170.09	0 00:17	1.79	0.25	0.37
C11	CONDUIT	191.39	0 00:17	1.44	0.33	0.48
C30	CONDUIT	19.98	0 00:17	0.59	0.20	0.31
C29	CONDUIT	30.84	0 00:17	0.89	0.23	0.32
C28	CONDUIT	41.63	0 00:17	1.21	0.21	0.32
C27	CONDUIT	52.37	0 00:17	0.88	0.23	0.48
C5	CONDUIT	48.72	0 00:17	0.80	0.46	0.49
C6	CONDUIT	70.44	0 00:17	1.10	0.49	0.51
C7	CONDUIT	92.07	0 00:17	1.35	0.53	0.53
C8	CONDUIT	113.70	0 00:17	1.73	0.58	0.52
C205	CONDUIT	63.07	0 00:17	0.92	8.44	0.54
C206	CONDUIT	430.23	0 00:17	1.74	7.09	0.61

****

Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.12	0.0000
C12	1.00	0.02	0.09	0.00	0.89	0.00	0.00	0.00	0.18	0.0000
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.19	0.0000
C14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.55	0.0000
C15	1.00	0.02	0.00	0.00	0.74	0.24	0.00	0.00	0.77	0.0000
C16	1.00	0.02	0.00	0.00	0.68	0.30	0.00	0.00	0.87	0.0000
C17	1.00	0.02	0.06	0.00	0.76	0.15	0.00	0.00	0.45	0.0000
C18	1.00	0.02	0.00	0.00	0.79	0.19	0.00	0.00	0.53	0.0000
C19	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.38	0.0000
C20	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.23	0.0000
C9	1.00	0.02	0.00	0.00	0.72	0.27	0.00	0.00	0.70	0.0000
C10	1.00	0.02	0.00	0.00	0.73	0.25	0.00	0.00	0.67	0.0000
C11	1.00	0.02	0.00	0.00	0.87	0.11	0.00	0.00	0.50	0.0000
C30	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.23	0.0000
C29	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.38	0.0000
C28	1.00	0.02	0.00	0.00	0.80	0.19	0.00	0.00	0.53	0.0000
C27	1.00	0.02	0.22	0.00	0.77	0.00	0.00	0.00	0.18	0.0000
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.28	0.0001
C6	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.40	0.0001
C7	1.00	0.02	0.00	0.00	0.82	0.17	0.00	0.00	0.50	0.0001
C8	1.00	0.02	0.00	0.00	0.67	0.31	0.00	0.00	0.70	0.0001
C205	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.25	0.0010
C206	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.48	0.0008

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C205	0.01	0.01	0.01	0.40	0.01
C206	0.01	0.01	0.01	0.39	0.01

- Durata 45' – T_R100anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 02:30:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec
********** Volume Depth
Runoff Quantity Continuity hectare-m mm
********** --------- -------

```
Total Precipitation ......        0.041       58.590
Evaporation Loss .........        0.000        0.000
Infiltration Loss ........        0.002        2.470
Surface Runoff ...........        0.039       54.851
Final Surface Storage ....        0.001        1.270
Continuity Error (%) .....        0.000
**************************      Volume       Volume
Flow Routing Continuity       hectare-m      10^6 ltr
**************************    ---------    ---------
Dry Weather Inflow .......        0.000        0.000
Wet Weather Inflow .......        0.039        0.385
Groundwater Inflow .......        0.000        0.000
RDII Inflow ..............        0.000        0.000
External Inflow ..........        0.000        0.000
External Outflow .........        0.017        0.167
Internal Outflow .........        0.000        0.000
Storage Losses ...........        0.000        0.000
Initial Stored Volume ....        0.000        0.000
Final Stored Volume ......        0.022        0.218
Continuity Error (%) .....        0.016
***************************
Time-Step Critical Elements
***************************
Link C57 (96.60%)
*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     0.50 sec
Average Time Step          :     0.52 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
****************************
Subcatchment Runoff Summary
****************************
-----------------------------------------------------------------------------------------------------
                   Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip    Runon     Evap      Infil     Runoff    Runoff    Runoff  Coeff
Subcatchment          mm        mm        mm        mm        mm    10^6 ltr     LPS
-----------------------------------------------------------------------------------------------------
S3                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S2                 58.59      0.00      0.00      2.47     54.85      0.02    17.52   0.936
S11                58.59      0.00      0.00      2.47     54.85      0.02    17.52   0.936
S12                58.59      0.00      0.00      2.47     54.85      0.02    17.52   0.936
S13                58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S17                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S19                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S21                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S23                58.59      0.00      0.00      2.47     54.85      0.02    20.01   0.936
S6                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S5                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S4                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S15                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S14                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S16                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S18                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S20                58.59      0.00      0.00      2.47     54.85      0.01    10.95   0.936
S22                58.59      0.00      0.00      2.47     54.85      0.02    20.01   0.936
S7                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S8                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S9                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S1                 58.59      0.00      0.00      2.47     54.85      0.02    21.90   0.936
S142               58.59      0.00      0.00      2.46     54.86      0.01    13.46   0.936
S143               58.59      0.00      0.00      2.47     54.85      0.04    48.77   0.936
******************
Node Depth Summary
******************
-----------------------------------------------------------------
                      Average  Maximum  Maximum  Time of Max
                        Depth    Depth      HGL   Occurrence
Node          Type     Meters   Meters   Meters  days hr:min
```

J25	JUNCTION	0.02	0.12	46.16	0	00:17
J24	JUNCTION	0.02	0.13	46.03	0	00:17
J23	JUNCTION	0.02	0.12	45.77	0	00:17
J22	JUNCTION	0.02	0.13	45.25	0	00:17
J21	JUNCTION	0.03	0.17	44.56	0	00:17
J19	JUNCTION	0.03	0.19	43.85	0	00:17
J18	JUNCTION	0.03	0.23	43.35	0	00:17
J17	JUNCTION	0.05	0.37	43.15	0	00:17
J15	JUNCTION	0.07	0.45	43.12	0	00:17
J13	JUNCTION	0.04	0.33	43.17	0	00:17
J12	JUNCTION	0.03	0.24	43.60	0	00:17
J11	JUNCTION	0.03	0.20	44.28	0	00:17
J10	JUNCTION	0.03	0.20	44.94	0	00:17
J173	JUNCTION	0.04	0.26	44.65	0	00:17
J176	JUNCTION	0.02	0.13	45.25	0	00:17
J177	JUNCTION	0.02	0.12	45.77	0	00:17
J178	JUNCTION	0.02	0.13	46.03	0	00:17
J179	JUNCTION	0.02	0.12	46.16	0	00:17
J187	JUNCTION	0.03	0.22	45.49	0	00:17
J188	JUNCTION	0.03	0.21	45.89	0	00:17
J189	JUNCTION	0.03	0.20	46.16	0	00:17
J190	JUNCTION	0.02	0.19	46.30	0	00:17
Out3	OUTFALL	0.09	0.09	40.26	0	00:11
1	STORAGE	0.94	1.23	41.40	0	00:34

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	20.01	20.01	0 00:17	0.018	0.018
J24	JUNCTION	10.95	30.93	0 00:17	0.010	0.027
J23	JUNCTION	10.95	41.77	0 00:17	0.010	0.037
J22	JUNCTION	10.95	52.55	0 00:17	0.010	0.046
J21	JUNCTION	10.95	126.17	0 00:17	0.010	0.112
J19	JUNCTION	21.90	147.47	0 00:17	0.019	0.131
J18	JUNCTION	17.52	164.37	0 00:17	0.015	0.146
J17	JUNCTION	17.52	181.14	0 00:17	0.015	0.162
J15	JUNCTION	39.42	430.44	0 00:17	0.035	0.385
J13	JUNCTION	21.90	212.93	0 00:17	0.019	0.189
J12	JUNCTION	21.90	191.81	0 00:17	0.019	0.170
J11	JUNCTION	21.90	170.44	0 00:17	0.019	0.151
J10	JUNCTION	35.36	148.91	0 00:17	0.031	0.131
J173	JUNCTION	10.95	63.27	0 00:17	0.010	0.056
J176	JUNCTION	10.95	52.55	0 00:17	0.010	0.046
J177	JUNCTION	10.95	41.77	0 00:17	0.010	0.037
J178	JUNCTION	10.95	30.93	0 00:17	0.010	0.027
J179	JUNCTION	20.01	20.01	0 00:17	0.018	0.018
J187	JUNCTION	21.90	113.92	0 00:17	0.019	0.100
J188	JUNCTION	21.90	92.32	0 00:17	0.019	0.081
J189	JUNCTION	21.90	70.61	0 00:17	0.019	0.062
J190	JUNCTION	48.77	48.77	0 00:17	0.043	0.043
Out3	OUTFALL	0.00	20.00	0 00:11	0.000	0.167
1	STORAGE	0.00	430.23	0 00:17	0.000	0.385

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.267	37	0	0.351	49	0 00:34	20.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	97.11	19.81	20.00	0.167
System	97.11	19.81	20.00	0.167

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	20.00	0 00:11	0.74	0.47	0.59
C12	CONDUIT	212.11	0 00:17	0.96	0.43	0.56
C13	CONDUIT	180.75	0 00:17	0.78	0.40	0.58
C14	CONDUIT	164.10	0 00:17	1.17	0.32	0.50
C15	CONDUIT	147.19	0 00:17	1.64	0.22	0.35
C16	CONDUIT	125.95	0 00:17	1.71	0.18	0.31
C17	CONDUIT	52.37	0 00:17	1.20	0.23	0.38
C18	CONDUIT	41.63	0 00:17	1.21	0.21	0.32
C19	CONDUIT	30.84	0 00:17	0.89	0.23	0.32
C20	CONDUIT	19.98	0 00:17	0.59	0.20	0.31
C9	CONDUIT	148.61	0 00:17	1.80	0.23	0.33
C10	CONDUIT	170.09	0 00:17	1.79	0.25	0.37
C11	CONDUIT	191.39	0 00:17	1.44	0.33	0.48
C30	CONDUIT	19.98	0 00:17	0.59	0.20	0.31
C29	CONDUIT	30.84	0 00:17	0.89	0.23	0.32
C28	CONDUIT	41.63	0 00:17	1.21	0.21	0.32
C27	CONDUIT	52.37	0 00:17	0.88	0.23	0.48
C5	CONDUIT	48.72	0 00:17	0.80	0.46	0.49
C6	CONDUIT	70.44	0 00:17	1.10	0.49	0.51
C7	CONDUIT	92.07	0 00:17	1.35	0.53	0.53
C8	CONDUIT	113.70	0 00:17	1.73	0.58	0.52
C205	CONDUIT	63.07	0 00:17	0.92	8.44	0.54
C206	CONDUIT	430.23	0 00:17	1.74	7.09	0.61

****
Flow Classification Summary
****

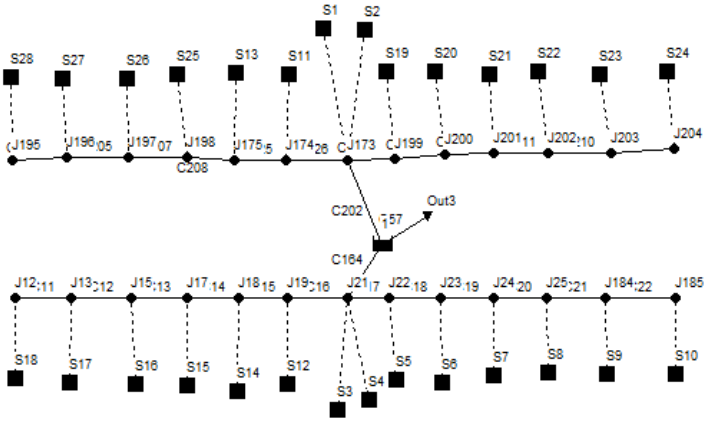
Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.12	0.0000
C12	1.00	0.02	0.09	0.00	0.89	0.00	0.00	0.18	0.0000
C13	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.19	0.0000
C14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.55	0.0000
C15	1.00	0.02	0.00	0.00	0.74	0.24	0.00	0.77	0.0000
C16	1.00	0.02	0.00	0.00	0.68	0.30	0.00	0.87	0.0000
C17	1.00	0.02	0.06	0.00	0.76	0.15	0.00	0.45	0.0000
C18	1.00	0.02	0.00	0.00	0.79	0.19	0.00	0.53	0.0000
C19	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.38	0.0000
C20	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.23	0.0000
C9	1.00	0.02	0.00	0.00	0.72	0.27	0.00	0.70	0.0000
C10	1.00	0.02	0.00	0.00	0.73	0.25	0.00	0.67	0.0000
C11	1.00	0.02	0.00	0.00	0.87	0.11	0.00	0.50	0.0000
C30	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.23	0.0000
C29	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.38	0.0000
C28	1.00	0.02	0.00	0.00	0.80	0.19	0.00	0.53	0.0000
C27	1.00	0.02	0.22	0.00	0.77	0.00	0.00	0.18	0.0000
C5	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.28	0.0001
C6	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.40	0.0001
C7	1.00	0.02	0.00	0.00	0.82	0.17	0.00	0.50	0.0001
C8	1.00	0.02	0.00	0.00	0.67	0.31	0.00	0.70	0.0001
C205	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.25	0.0010
C206	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.48	0.0008

****
Conduit Surcharge Summary

****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C205	0.01	0.01	0.01	0.40	0.01
C206	0.01	0.01	0.01	0.39	0.01

ST02 – SOTTOPASSO DI VIA HIROSHIMA



- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.041        46.400
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.002         2.589
Surface Runoff ...........        0.037        42.600
Final Surface Storage ....        0.001         1.270
Continuity Error (%) .....       -0.127
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.037         0.373
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.022         0.215
Internal Outflow .........        0.000         0.000
```

Storage Losses 0.000 0.000
Initial Stored Volume 0.000 0.000
Final Stored Volume 0.016 0.158
Continuity Error (%) 0.000
****
Time-Step Critical Elements
****
Link C57 (97.95%)
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 0.51 sec
Maximum Time Step : 1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S17	46.40	0.00	0.00	2.45	42.75	0.01	27.33	0.921
S16	46.40	0.00	0.00	2.45	42.75	0.01	27.33	0.921
S15	46.40	0.00	0.00	2.45	42.75	0.01	27.43	0.921
S14	46.40	0.00	0.00	2.46	42.73	0.01	27.38	0.921
S12	46.40	0.00	0.00	2.46	42.73	0.01	21.81	0.921
S4	46.40	0.00	0.00	2.46	42.73	0.01	21.81	0.921
S5	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S6	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S7	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S8	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S18	46.40	0.00	0.00	2.45	42.75	0.01	32.39	0.921
S3	46.40	0.00	0.00	2.46	42.73	0.01	21.81	0.921
S13	46.40	0.00	0.00	2.46	42.73	0.01	27.38	0.921
S11	46.40	0.00	0.00	2.46	42.73	0.01	21.81	0.921
S1	46.40	0.00	0.00	2.46	42.73	0.01	21.81	0.921
S9	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S10	46.40	0.00	0.00	2.47	42.69	0.04	99.21	0.920
S2	46.40	0.00	0.00	2.46	42.73	0.01	21.81	0.921
S25	46.40	0.00	0.00	2.45	42.75	0.01	27.43	0.921
S26	46.40	0.00	0.00	2.46	42.73	0.01	27.18	0.921
S27	46.40	0.00	0.00	2.45	42.75	0.01	27.33	0.921
S28	46.40	0.00	0.00	2.45	42.75	0.01	32.39	0.921
S19	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S20	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S21	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S22	46.40	0.00	0.00	6.78	38.42	0.01	26.14	0.828
S23	46.40	0.00	0.00	2.45	42.75	0.01	27.53	0.921
S24	46.40	0.00	0.00	2.47	42.69	0.04	99.21	0.920

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.01	0.21	44.80	0 00:08
J24	JUNCTION	0.01	0.19	43.66	0 00:08
J23	JUNCTION	0.02	0.24	42.77	0 00:08
J22	JUNCTION	0.03	0.39	42.41	0 00:08
J21	JUNCTION	0.04	0.44	42.36	0 00:09
J19	JUNCTION	0.02	0.36	42.38	0 00:08
J18	JUNCTION	0.01	0.19	42.66	0 00:08
J17	JUNCTION	0.01	0.16	43.48	0 00:08
J15	JUNCTION	0.01	0.16	44.39	0 00:08
J13	JUNCTION	0.01	0.13	45.27	0 00:08
J12	JUNCTION	0.01	0.10	46.15	0 00:08

J173	JUNCTION	0.04	0.44	42.36	0	00:09
J174	JUNCTION	0.02	0.36	42.38	0	00:09
J175	JUNCTION	0.01	0.19	42.66	0	00:08
J184	JUNCTION	0.01	0.18	45.88	0	00:08
J185	JUNCTION	0.01	0.16	46.98	0	00:08
J195	JUNCTION	0.01	0.10	46.15	0	00:08
J196	JUNCTION	0.01	0.13	45.27	0	00:08
J197	JUNCTION	0.01	0.16	44.39	0	00:08
J198	JUNCTION	0.01	0.16	43.48	0	00:08
J199	JUNCTION	0.03	0.39	42.41	0	00:09
J200	JUNCTION	0.02	0.24	42.77	0	00:08
J201	JUNCTION	0.01	0.19	43.66	0	00:08
J202	JUNCTION	0.01	0.21	44.80	0	00:08
J203	JUNCTION	0.01	0.18	45.88	0	00:08
J204	JUNCTION	0.01	0.16	46.98	0	00:08
Out3	OUTFALL	0.10	0.10	39.52	0	00:06
1	STORAGE	0.71	0.99	40.41	0	00:19

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	27.53	152.07	0	00:08	0.012	0.066
J24	JUNCTION	27.53	177.64	0	00:08	0.012	0.077
J23	JUNCTION	27.53	202.79	0	00:08	0.012	0.089
J22	JUNCTION	27.53	225.69	0	00:08	0.012	0.100
J21	JUNCTION	43.61	413.92	0	00:08	0.018	0.187
J19	JUNCTION	21.80	157.72	0	00:08	0.009	0.069
J18	JUNCTION	27.38	138.63	0	00:08	0.012	0.059
J17	JUNCTION	27.43	112.79	0	00:08	0.011	0.048
J15	JUNCTION	27.33	86.31	0	00:08	0.011	0.036
J13	JUNCTION	27.33	59.58	0	00:08	0.011	0.025
J12	JUNCTION	32.38	32.38	0	00:08	0.014	0.014
J173	JUNCTION	43.61	412.06	0	00:08	0.018	0.186
J174	JUNCTION	21.80	157.31	0	00:08	0.009	0.069
J175	JUNCTION	27.38	138.30	0	00:08	0.012	0.059
J184	JUNCTION	27.53	126.10	0	00:08	0.012	0.054
J185	JUNCTION	99.18	99.18	0	00:08	0.043	0.043
J195	JUNCTION	32.38	32.38	0	00:08	0.014	0.014
J196	JUNCTION	27.33	59.58	0	00:08	0.011	0.025
J197	JUNCTION	27.18	86.16	0	00:08	0.011	0.036
J198	JUNCTION	27.43	112.55	0	00:08	0.011	0.048
J199	JUNCTION	27.53	224.00	0	00:08	0.012	0.099
J200	JUNCTION	27.53	201.21	0	00:08	0.012	0.088
J201	JUNCTION	27.53	176.15	0	00:08	0.012	0.076
J202	JUNCTION	26.13	150.68	0	00:08	0.010	0.065
J203	JUNCTION	27.53	126.10	0	00:08	0.012	0.054
J204	JUNCTION	99.18	99.18	0	00:08	0.043	0.043
Out3	OUTFALL	0.00	25.00	0	00:06	0.000	0.215
1	STORAGE	0.00	824.83	0	00:09	0.000	0.373

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow LPS
1	0.249	28	0	0.347	40	0	00:19	25.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	98.27	24.85	25.00	0.215
System	98.27	24.85	25.00	0.215

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	25.00	0 00:06	0.78	0.58	0.60
C12	CONDUIT	59.01	0 00:08	1.44	0.23	0.36
C13	CONDUIT	85.52	0 00:08	1.85	0.33	0.40
C14	CONDUIT	111.41	0 00:08	1.61	0.15	0.29
C15	CONDUIT	136.32	0 00:08	1.11	0.23	0.46
C16	CONDUIT	152.96	0 00:08	0.68	0.36	0.57
C17	CONDUIT	221.40	0 00:08	0.94	0.52	0.59
C18	CONDUIT	198.94	0 00:08	1.32	0.35	0.53
C19	CONDUIT	175.64	0 00:08	1.88	0.23	0.37
C20	CONDUIT	150.60	0 00:08	2.38	0.53	0.50
C11	CONDUIT	32.26	0 00:08	1.11	0.12	0.28
C164	CONDUIT	413.32	0 00:09	1.71	6.81	0.60
C25	CONDUIT	135.92	0 00:08	1.11	0.23	0.46
C26	CONDUIT	152.59	0 00:08	0.68	0.36	0.57
C22	CONDUIT	98.61	0 00:08	1.89	0.34	0.43
C21	CONDUIT	124.69	0 00:08	2.03	0.44	0.49
C202	CONDUIT	411.52	0 00:09	1.71	6.78	0.60
C205	CONDUIT	59.01	0 00:08	1.44	0.23	0.36
C206	CONDUIT	32.26	0 00:08	1.11	0.12	0.28
C207	CONDUIT	85.32	0 00:08	1.85	0.33	0.40
C208	CONDUIT	111.09	0 00:08	1.61	0.15	0.29
C209	CONDUIT	98.61	0 00:08	1.89	0.34	0.43
C210	CONDUIT	124.69	0 00:08	2.04	0.44	0.49
C211	CONDUIT	149.15	0 00:08	2.38	0.52	0.50
C212	CONDUIT	174.08	0 00:08	1.87	0.22	0.36
C213	CONDUIT	197.28	0 00:08	1.32	0.35	0.52
C214	CONDUIT	219.84	0 00:08	0.93	0.52	0.59

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.14	0.0000
C12	1.00	0.01	0.00	0.00	0.88	0.11	0.00	0.30	0.0000
C13	1.00	0.01	0.00	0.00	0.79	0.20	0.00	0.41	0.0000
C14	1.00	0.01	0.00	0.00	0.88	0.11	0.00	0.31	0.0000
C15	1.00	0.01	0.03	0.00	0.95	0.01	0.00	0.20	0.0000
C16	1.00	0.01	0.43	0.00	0.56	0.00	0.00	0.07	0.0000
C17	1.00	0.01	0.26	0.00	0.73	0.00	0.00	0.13	0.0001
C18	1.00	0.01	0.01	0.00	0.97	0.01	0.00	0.33	0.0000
C19	1.00	0.01	0.00	0.00	0.81	0.18	0.00	0.50	0.0000
C20	1.00	0.01	0.00	0.00	0.58	0.41	0.00	0.71	0.0001
C11	1.00	0.01	0.00	0.00	0.91	0.08	0.00	0.23	0.0000
C164	1.00	0.01	0.00	0.00	0.00	0.00	0.99	0.34	0.0008
C25	1.00	0.01	0.04	0.00	0.95	0.01	0.00	0.21	0.0000
C26	1.00	0.01	0.42	0.00	0.57	0.00	0.00	0.07	0.0000
C22	1.00	0.01	0.00	0.00	0.72	0.27	0.00	0.56	0.0000
C21	1.00	0.01	0.00	0.00	0.71	0.28	0.00	0.59	0.0001
C202	1.00	0.01	0.00	0.00	0.00	0.00	0.99	0.34	0.0008
C205	1.00	0.01	0.00	0.00	0.90	0.09	0.00	0.29	0.0000
C206	1.00	0.01	0.00	0.00	0.91	0.08	0.00	0.23	0.0000
C207	1.00	0.01	0.00	0.00	0.78	0.21	0.00	0.42	0.0000
C208	1.00	0.01	0.00	0.00	0.88	0.11	0.00	0.32	0.0000
C209	1.00	0.01	0.00	0.00	0.72	0.27	0.00	0.56	0.0000
C210	1.00	0.01	0.00	0.00	0.70	0.28	0.00	0.60	0.0001
C211	1.00	0.01	0.00	0.00	0.58	0.41	0.00	0.71	0.0001
C212	1.00	0.01	0.00	0.00	0.81	0.18	0.00	0.50	0.0000

```
C213              1.00  0.01  0.01  0.00  0.97  0.01  0.00  0.00    0.32  0.0000
C214              1.00  0.01  0.26  0.00  0.73  0.00  0.00  0.00    0.13  0.0001
*************************
Conduit Surcharge Summary
*************************
-------------------------------------------------------------------------------
                                          Hours      Hours
              --------- Hours Full --------  Above Full  Capacity
Conduit           Both Ends  Upstream  Dnstream  Normal Flow  Limited
-------------------------------------------------------------------------------
C164                 0.01      0.01      0.01      0.19        0.01
C202                 0.01      0.01      0.01      0.19        0.01
```

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m          mm
**************************     ---------       -------
Total Precipitation ......        0.051        58.590
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.002         2.610
Surface Runoff ...........        0.048        54.711
Final Surface Storage ....        0.001         1.270
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************     ---------    ---------
Dry Weather Inflow .......        0.000        0.000
Wet Weather Inflow .......        0.048        0.480
Groundwater Inflow .......        0.000        0.000
RDII Inflow ..............        0.000        0.000
External Inflow ..........        0.000        0.000
External Outflow .........        0.021        0.209
Internal Outflow .........        0.000        0.000
Storage Losses ...........        0.000        0.000
Initial Stored Volume ....        0.000        0.000
Final Stored Volume ......        0.027        0.271
Continuity Error (%) .....        0.013
****************************
Time-Step Critical Elements
****************************
Link C57 (96.71%)
*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
```

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 0.52 sec
Maximum Time Step : 1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S17	58.59	0.00	0.00	2.47	54.85	0.01	16.77	0.936
S16	58.59	0.00	0.00	2.47	54.85	0.01	16.77	0.936
S15	58.59	0.00	0.00	2.47	54.85	0.01	16.83	0.936
S14	58.59	0.00	0.00	2.47	54.85	0.01	16.89	0.936
S12	58.59	0.00	0.00	2.47	54.85	0.01	13.45	0.936
S4	58.59	0.00	0.00	2.47	54.85	0.01	13.45	0.936
S5	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S6	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S7	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S8	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S18	58.59	0.00	0.00	2.47	54.85	0.02	19.90	0.936
S3	58.59	0.00	0.00	2.47	54.85	0.01	13.45	0.936
S13	58.59	0.00	0.00	2.47	54.85	0.01	16.89	0.936
S11	58.59	0.00	0.00	2.47	54.85	0.01	13.45	0.936
S1	58.59	0.00	0.00	2.47	54.85	0.01	13.45	0.936
S9	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S10	58.59	0.00	0.00	2.48	54.84	0.05	62.28	0.936
S2	58.59	0.00	0.00	2.47	54.85	0.01	13.45	0.936
S25	58.59	0.00	0.00	2.47	54.85	0.01	16.83	0.936
S26	58.59	0.00	0.00	2.47	54.85	0.01	16.76	0.936
S27	58.59	0.00	0.00	2.47	54.85	0.01	16.77	0.936
S28	58.59	0.00	0.00	2.47	54.85	0.02	19.90	0.936
S19	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S20	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S21	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S22	58.59	0.00	0.00	6.96	50.36	0.01	16.33	0.860
S23	58.59	0.00	0.00	2.47	54.85	0.01	16.90	0.936
S24	58.59	0.00	0.00	2.48	54.84	0.05	62.28	0.936

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.02	0.16	44.75	0 00:17
J24	JUNCTION	0.02	0.15	43.62	0 00:17
J23	JUNCTION	0.03	0.19	42.72	0 00:17
J22	JUNCTION	0.04	0.30	42.32	0 00:17
J21	JUNCTION	0.06	0.35	42.27	0 00:17
J19	JUNCTION	0.04	0.27	42.29	0 00:17
J18	JUNCTION	0.02	0.15	42.62	0 00:17
J17	JUNCTION	0.02	0.13	43.45	0 00:17
J15	JUNCTION	0.02	0.12	44.35	0 00:17
J13	JUNCTION	0.01	0.10	45.24	0 00:17
J12	JUNCTION	0.01	0.08	46.13	0 00:17
J173	JUNCTION	0.06	0.35	42.27	0 00:17
J174	JUNCTION	0.04	0.27	42.29	0 00:17
J175	JUNCTION	0.02	0.15	42.62	0 00:17
J184	JUNCTION	0.02	0.14	45.84	0 00:17
J185	JUNCTION	0.02	0.13	46.95	0 00:17
J195	JUNCTION	0.01	0.08	46.13	0 00:17
J196	JUNCTION	0.01	0.10	45.24	0 00:17
J197	JUNCTION	0.02	0.12	44.35	0 00:17
J198	JUNCTION	0.02	0.13	43.45	0 00:17
J199	JUNCTION	0.04	0.30	42.32	0 00:17
J200	JUNCTION	0.03	0.19	42.72	0 00:17
J201	JUNCTION	0.02	0.15	43.62	0 00:17

J202	JUNCTION	0.02	0.16	44.75	0	00:17
J203	JUNCTION	0.02	0.14	45.84	0	00:17
J204	JUNCTION	0.02	0.13	46.95	0	00:17
Out3	OUTFALL	0.10	0.10	39.52	0	00:11
1	STORAGE	0.95	1.25	40.67	0	00:34

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	16.90	95.87	0 00:17	0.015	0.084
J24	JUNCTION	16.90	112.60	0 00:17	0.015	0.099
J23	JUNCTION	16.90	129.30	0 00:17	0.015	0.114
J22	JUNCTION	16.90	145.80	0 00:17	0.015	0.129
J21	JUNCTION	26.89	270.91	0 00:17	0.024	0.241
J19	JUNCTION	13.45	100.26	0 00:17	0.012	0.088
J18	JUNCTION	16.89	86.99	0 00:17	0.015	0.076
J17	JUNCTION	16.83	70.18	0 00:17	0.015	0.062
J15	JUNCTION	16.77	53.40	0 00:17	0.015	0.047
J13	JUNCTION	16.77	36.66	0 00:17	0.015	0.032
J12	JUNCTION	19.90	19.90	0 00:17	0.017	0.017
J173	JUNCTION	26.89	270.18	0 00:17	0.024	0.240
J174	JUNCTION	13.45	100.23	0 00:17	0.012	0.088
J175	JUNCTION	16.89	86.96	0 00:17	0.015	0.076
J184	JUNCTION	16.90	79.11	0 00:17	0.015	0.070
J185	JUNCTION	62.28	62.28	0 00:17	0.055	0.055
J195	JUNCTION	19.90	19.90	0 00:17	0.017	0.017
J196	JUNCTION	16.77	36.66	0 00:17	0.015	0.032
J197	JUNCTION	16.76	53.39	0 00:17	0.015	0.047
J198	JUNCTION	16.83	70.17	0 00:17	0.015	0.062
J199	JUNCTION	16.90	145.17	0 00:17	0.015	0.128
J200	JUNCTION	16.90	128.69	0 00:17	0.015	0.113
J201	JUNCTION	16.90	112.02	0 00:17	0.015	0.098
J202	JUNCTION	16.33	95.30	0 00:17	0.014	0.083
J203	JUNCTION	16.90	79.11	0 00:17	0.015	0.070
J204	JUNCTION	62.28	62.28	0 00:17	0.055	0.055
Out3	OUTFALL	0.00	25.00	0 00:11	0.000	0.209
1	STORAGE	0.00	540.73	0 00:17	0.000	0.480

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Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.332	38	0	0.438	50	0 00:34	25.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	97.13	24.76	25.00	0.209
System	97.13	24.76	25.00	0.209

****
Link Flow Summary
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Maximum	Time of Max	Maximum	Max/	Max/

Link	Type	|Flow| LPS	Occurrence days	hr:min	|Veloc| m/sec	Full Flow	Full Depth
C57	CONDUIT	25.00	0	00:11	0.79	0.58	0.60
C12	CONDUIT	36.63	0	00:17	1.26	0.14	0.28
C13	CONDUIT	53.35	0	00:17	1.60	0.21	0.31
C14	CONDUIT	70.11	0	00:17	1.40	0.10	0.23
C15	CONDUIT	86.85	0	00:17	0.96	0.15	0.36
C16	CONDUIT	99.59	0	00:17	0.59	0.23	0.45
C17	CONDUIT	145.19	0	00:17	0.82	0.34	0.47
C18	CONDUIT	129.01	0	00:17	1.18	0.23	0.41
C19	CONDUIT	112.45	0	00:17	1.65	0.15	0.29
C20	CONDUIT	95.76	0	00:17	2.09	0.33	0.39
C11	CONDUIT	19.89	0	00:17	0.96	0.08	0.22
C164	CONDUIT	270.72	0	00:17	1.47	4.46	0.48
C25	CONDUIT	86.81	0	00:17	0.96	0.14	0.36
C26	CONDUIT	99.54	0	00:17	0.60	0.23	0.45
C22	CONDUIT	62.22	0	00:17	1.66	0.22	0.34
C21	CONDUIT	78.99	0	00:17	1.80	0.28	0.38
C202	CONDUIT	270.01	0	00:17	1.47	4.45	0.48
C205	CONDUIT	36.63	0	00:17	1.26	0.14	0.28
C206	CONDUIT	19.89	0	00:17	0.96	0.08	0.22
C207	CONDUIT	53.34	0	00:17	1.60	0.21	0.31
C208	CONDUIT	70.09	0	00:17	1.40	0.10	0.23
C209	CONDUIT	62.22	0	00:17	1.66	0.22	0.34
C210	CONDUIT	78.99	0	00:17	1.81	0.28	0.38
C211	CONDUIT	95.18	0	00:17	2.08	0.33	0.39
C212	CONDUIT	111.85	0	00:17	1.65	0.14	0.29
C213	CONDUIT	128.39	0	00:17	1.18	0.23	0.41
C214	CONDUIT	144.55	0	00:17	0.82	0.34	0.47

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.14	0.0000
C12	1.00	0.02	0.00	0.00	0.79	0.19	0.00	0.44	0.0000
C13	1.00	0.02	0.00	0.00	0.69	0.29	0.00	0.58	0.0000
C14	1.00	0.02	0.00	0.00	0.79	0.19	0.00	0.45	0.0000
C15	1.00	0.02	0.02	0.00	0.95	0.01	0.00	0.30	0.0000
C16	1.00	0.02	0.30	0.00	0.68	0.00	0.00	0.11	0.0000
C17	1.00	0.02	0.06	0.00	0.92	0.00	0.00	0.18	0.0000
C18	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.46	0.0000
C19	1.00	0.02	0.00	0.00	0.72	0.26	0.00	0.71	0.0000
C20	1.00	0.02	0.00	0.00	0.45	0.54	0.00	1.01	0.0000
C11	1.00	0.02	0.00	0.00	0.82	0.16	0.00	0.35	0.0000
C164	1.00	0.02	0.00	0.00	0.00	0.00	0.98	0.41	0.0005
C25	1.00	0.02	0.02	0.00	0.95	0.01	0.00	0.30	0.0000
C26	1.00	0.02	0.29	0.00	0.70	0.00	0.00	0.11	0.0000
C22	1.00	0.02	0.00	0.00	0.62	0.36	0.00	0.82	0.0000
C21	1.00	0.02	0.00	0.00	0.60	0.38	0.00	0.84	0.0000
C202	1.00	0.02	0.00	0.00	0.00	0.00	0.98	0.41	0.0005
C205	1.00	0.02	0.00	0.00	0.80	0.18	0.00	0.43	0.0000
C206	1.00	0.02	0.00	0.00	0.82	0.16	0.00	0.35	0.0000
C207	1.00	0.02	0.00	0.00	0.68	0.30	0.00	0.60	0.0000
C208	1.00	0.02	0.00	0.00	0.79	0.19	0.00	0.47	0.0000
C209	1.00	0.02	0.00	0.00	0.62	0.36	0.00	0.82	0.0000
C210	1.00	0.02	0.00	0.00	0.60	0.38	0.00	0.85	0.0000
C211	1.00	0.02	0.00	0.00	0.45	0.53	0.00	1.01	0.0000
C212	1.00	0.02	0.00	0.00	0.72	0.26	0.00	0.71	0.0000
C213	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.46	0.0000
C214	1.00	0.02	0.06	0.00	0.92	0.00	0.00	0.18	0.0000

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Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C164	0.01	0.01	0.01	0.36	0.01
C202	0.01	0.01	0.01	0.35	0.01

- Durata 45' – T_R100anni

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
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*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.059        67.290
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.002         2.622
Surface Runoff ...........         0.056        63.398
Final Surface Storage ....         0.001         1.271
Continuity Error (%) .....         0.000
**************************       Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.056         0.556
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.020         0.204
Internal Outflow .........         0.000         0.000
Storage Losses ...........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.035         0.352
Continuity Error (%) .....         0.021
****************************
Time-Step Critical Elements
****************************
Link C57 (95.54%)
*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.52 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
****************************
Subcatchment Runoff Summary
****************************
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Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S17	67.29	0.00	0.00	2.48	63.54	0.02	12.86	0.944
S16	67.29	0.00	0.00	2.48	63.54	0.02	12.86	0.944
S15	67.29	0.00	0.00	2.48	63.54	0.02	12.91	0.944
S14	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S12	67.29	0.00	0.00	2.48	63.54	0.01	10.31	0.944
S4	67.29	0.00	0.00	2.48	63.54	0.01	10.31	0.944
S5	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S6	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S7	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S8	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S18	67.29	0.00	0.00	2.48	63.54	0.02	15.26	0.944
S3	67.29	0.00	0.00	2.48	63.54	0.01	10.31	0.944
S13	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S11	67.29	0.00	0.00	2.48	63.54	0.01	10.31	0.944
S1	67.29	0.00	0.00	2.48	63.54	0.01	10.31	0.944
S9	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S10	67.29	0.00	0.00	2.49	63.53	0.06	47.90	0.944
S2	67.29	0.00	0.00	2.48	63.54	0.01	10.31	0.944
S25	67.29	0.00	0.00	2.48	63.54	0.02	12.91	0.944
S26	67.29	0.00	0.00	2.48	63.54	0.02	12.86	0.944
S27	67.29	0.00	0.00	2.48	63.54	0.02	12.86	0.944
S28	67.29	0.00	0.00	2.48	63.54	0.02	15.26	0.944
S19	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S20	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S21	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S22	67.29	0.00	0.00	7.06	58.96	0.02	12.61	0.876
S23	67.29	0.00	0.00	2.48	63.54	0.02	12.95	0.944
S24	67.29	0.00	0.00	2.49	63.53	0.06	47.90	0.944

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.03	0.14	44.73	0 00:25
J24	JUNCTION	0.03	0.14	43.61	0 00:25
J23	JUNCTION	0.04	0.17	42.70	0 00:25
J22	JUNCTION	0.05	0.26	42.28	0 00:25
J21	JUNCTION	0.07	0.31	42.23	0 00:25
J19	JUNCTION	0.04	0.23	42.25	0 00:25
J18	JUNCTION	0.03	0.14	42.61	0 00:25
J17	JUNCTION	0.02	0.11	43.43	0 00:25
J15	JUNCTION	0.02	0.11	44.34	0 00:25
J13	JUNCTION	0.02	0.09	45.23	0 00:25
J12	JUNCTION	0.01	0.07	46.12	0 00:25
J173	JUNCTION	0.07	0.31	42.23	0 00:25
J174	JUNCTION	0.04	0.23	42.25	0 00:25
J175	JUNCTION	0.03	0.14	42.61	0 00:25
J184	JUNCTION	0.03	0.13	45.83	0 00:25
J185	JUNCTION	0.02	0.11	46.93	0 00:25
J195	JUNCTION	0.01	0.07	46.12	0 00:25
J196	JUNCTION	0.02	0.09	45.23	0 00:25
J197	JUNCTION	0.02	0.11	44.34	0 00:25
J198	JUNCTION	0.02	0.11	43.43	0 00:25
J199	JUNCTION	0.05	0.26	42.28	0 00:25
J200	JUNCTION	0.04	0.17	42.70	0 00:25
J201	JUNCTION	0.03	0.14	43.61	0 00:25
J202	JUNCTION	0.03	0.14	44.73	0 00:25
J203	JUNCTION	0.03	0.13	45.83	0 00:25
J204	JUNCTION	0.02	0.11	46.93	0 00:25
Out3	OUTFALL	0.10	0.10	39.52	0 00:15
1	STORAGE	1.08	1.42	40.84	0 00:48

****
Node Inflow Summary
****

	Maximum Lateral Inflow	Maximum Total Inflow	Time of Max Occurrence	Lateral Inflow Volume	Total Inflow Volume

Node	Type	LPS	LPS	days hr:min	10^6 ltr	10^6 ltr
J25	JUNCTION	12.95	73.76	0 00:25	0.017	0.098
J24	JUNCTION	12.95	86.67	0 00:25	0.017	0.115
J23	JUNCTION	12.95	99.58	0 00:25	0.017	0.132
J22	JUNCTION	12.95	112.44	0 00:25	0.017	0.149
J21	JUNCTION	20.63	209.68	0 00:25	0.027	0.279
J19	JUNCTION	10.31	77.08	0 00:25	0.014	0.102
J18	JUNCTION	12.95	66.80	0 00:25	0.017	0.089
J17	JUNCTION	12.91	53.86	0 00:25	0.017	0.071
J15	JUNCTION	12.86	40.96	0 00:25	0.017	0.054
J13	JUNCTION	12.86	28.11	0 00:25	0.017	0.037
J12	JUNCTION	15.26	15.26	0 00:25	0.020	0.020
J173	JUNCTION	20.63	209.27	0 00:25	0.027	0.278
J174	JUNCTION	10.31	77.08	0 00:25	0.014	0.102
J175	JUNCTION	12.95	66.79	0 00:25	0.017	0.089
J184	JUNCTION	12.95	60.84	0 00:25	0.017	0.081
J185	JUNCTION	47.90	47.90	0 00:25	0.064	0.064
J195	JUNCTION	15.26	15.26	0 00:25	0.020	0.020
J196	JUNCTION	12.86	28.11	0 00:25	0.017	0.037
J197	JUNCTION	12.86	40.96	0 00:25	0.017	0.054
J198	JUNCTION	12.91	53.85	0 00:25	0.017	0.071
J199	JUNCTION	12.95	112.07	0 00:25	0.017	0.148
J200	JUNCTION	12.95	99.22	0 00:25	0.017	0.131
J201	JUNCTION	12.95	86.32	0 00:25	0.017	0.114
J202	JUNCTION	12.61	73.41	0 00:25	0.016	0.097
J203	JUNCTION	12.95	60.84	0 00:25	0.017	0.081
J204	JUNCTION	47.90	47.90	0 00:25	0.064	0.064
Out3	OUTFALL	0.00	25.00	0 00:15	0.000	0.204
1	STORAGE	0.00	418.59	0 00:25	0.000	0.556

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.378	43	0	0.497	57	0 00:48	25.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	96.10	24.67	25.00	0.204
System	96.10	24.67	25.00	0.204

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	25.00	0 00:15	0.79	0.58	0.60
C12	CONDUIT	28.10	0 00:25	1.17	0.11	0.25
C13	CONDUIT	40.95	0 00:25	1.48	0.16	0.27
C14	CONDUIT	53.85	0 00:25	1.30	0.07	0.20
C15	CONDUIT	66.77	0 00:25	0.92	0.11	0.31
C16	CONDUIT	76.89	0 00:25	0.56	0.18	0.39
C17	CONDUIT	112.23	0 00:25	0.76	0.26	0.41
C18	CONDUIT	99.50	0 00:25	1.11	0.17	0.35
C19	CONDUIT	86.63	0 00:25	1.53	0.11	0.25

C20	CONDUIT	73.72	0	00:25	1.93	0.26	0.34
C11	CONDUIT	15.25	0	00:25	0.89	0.06	0.19
C164	CONDUIT	209.50	0	00:25	1.34	3.45	0.42
C25	CONDUIT	66.77	0	00:25	0.92	0.11	0.31
C26	CONDUIT	76.88	0	00:25	0.56	0.18	0.39
C22	CONDUIT	47.88	0	00:25	1.55	0.17	0.29
C21	CONDUIT	60.80	0	00:25	1.68	0.21	0.33
C202	CONDUIT	209.09	0	00:25	1.34	3.45	0.42
C205	CONDUIT	28.10	0	00:25	1.17	0.11	0.25
C206	CONDUIT	15.25	0	00:25	0.89	0.06	0.19
C207	CONDUIT	40.95	0	00:25	1.48	0.16	0.27
C208	CONDUIT	53.84	0	00:25	1.30	0.07	0.20
C209	CONDUIT	47.88	0	00:25	1.55	0.17	0.29
C210	CONDUIT	60.80	0	00:25	1.68	0.21	0.33
C211	CONDUIT	73.37	0	00:25	1.93	0.26	0.34
C212	CONDUIT	86.27	0	00:25	1.53	0.11	0.25
C213	CONDUIT	99.13	0	00:25	1.11	0.17	0.35
C214	CONDUIT	111.85	0	00:25	0.76	0.26	0.41

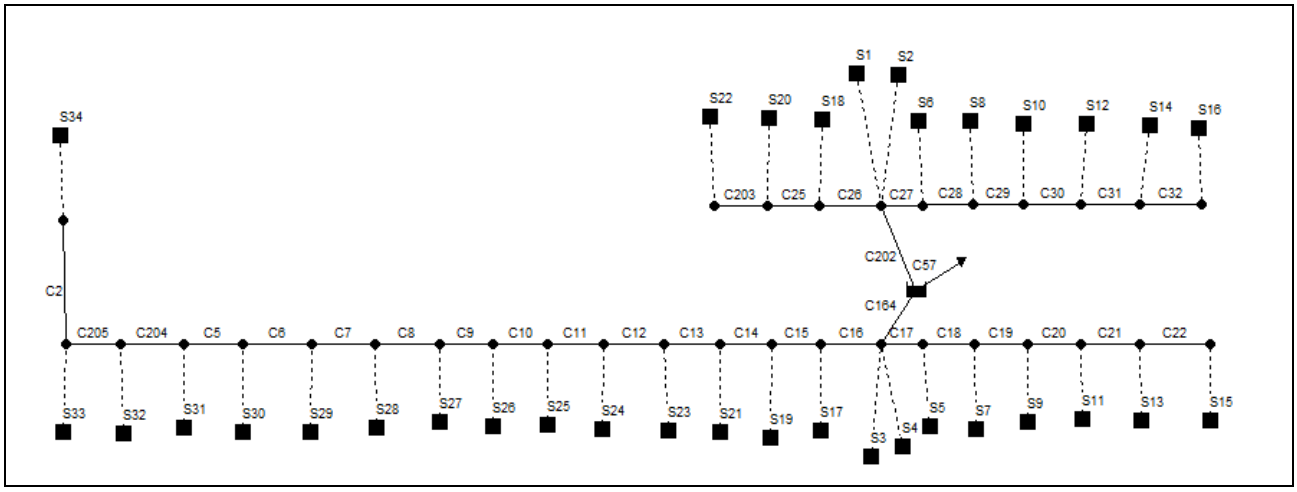
****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.15	0.0000
C12	1.00	0.03	0.00	0.00	0.69	0.28	0.00	0.58	0.0000
C13	1.00	0.03	0.00	0.00	0.59	0.38	0.00	0.75	0.0000
C14	1.00	0.03	0.00	0.00	0.70	0.28	0.00	0.59	0.0000
C15	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.39	0.0000
C16	1.00	0.03	0.17	0.00	0.81	0.00	0.00	0.14	0.0000
C17	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.23	0.0000
C18	1.00	0.03	0.00	0.00	0.96	0.01	0.00	0.57	0.0000
C19	1.00	0.03	0.00	0.00	0.62	0.35	0.00	0.87	0.0000
C20	1.00	0.03	0.00	0.00	0.33	0.64	0.00	1.24	0.0000
C11	1.00	0.03	0.00	0.00	0.73	0.25	0.00	0.47	0.0000
C164	1.00	0.03	0.00	0.00	0.00	0.00	0.97	0.00	0.48	0.0004
C25	1.00	0.03	0.01	0.00	0.96	0.01	0.00	0.00	0.40	0.0000
C26	1.00	0.03	0.15	0.00	0.82	0.00	0.00	0.00	0.15	0.0000
C22	1.00	0.03	0.00	0.00	0.52	0.45	0.00	0.00	1.03	0.0000
C21	1.00	0.03	0.00	0.00	0.51	0.47	0.00	0.00	1.05	0.0000
C202	1.00	0.03	0.00	0.00	0.00	0.00	0.97	0.00	0.48	0.0004
C205	1.00	0.03	0.00	0.00	0.70	0.27	0.00	0.00	0.56	0.0000
C206	1.00	0.03	0.00	0.00	0.73	0.25	0.00	0.00	0.47	0.0000
C207	1.00	0.03	0.00	0.00	0.58	0.39	0.00	0.00	0.79	0.0000
C208	1.00	0.03	0.00	0.00	0.69	0.28	0.00	0.00	0.62	0.0000
C209	1.00	0.03	0.00	0.00	0.52	0.45	0.00	0.00	1.03	0.0000
C210	1.00	0.03	0.00	0.00	0.50	0.47	0.00	0.00	1.06	0.0000
C211	1.00	0.03	0.00	0.00	0.33	0.64	0.00	0.00	1.24	0.0000
C212	1.00	0.03	0.00	0.00	0.63	0.35	0.00	0.00	0.87	0.0000
C213	1.00	0.03	0.00	0.00	0.97	0.01	0.00	0.00	0.57	0.0000
C214	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.23	0.0000

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C164	0.01	0.01	0.01	0.51	0.01
C202	0.01	0.01	0.01	0.50	0.01

ST03 – SOTTOPASSO DI PIEVE-MODOLENA



- Durata 15' – T_R100anni

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......        0.041        46.400
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.002         2.472
Surface Runoff ...........        0.037        42.707
Final Surface Storage ....        0.001         1.272
Continuity Error (%) .....       -0.108
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.037         0.373
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.021         0.214
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
```

Initial Stored Volume 0.000 0.000
Final Stored Volume 0.016 0.158
Continuity Error (%) 0.000
****
Time-Step Critical Elements
****
Link C57 (97.68%)
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 0.51 sec
Maximum Time Step : 1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S24	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S23	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S21	46.40	0.00	0.00	2.45	42.76	0.01	15.30	0.921
S19	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S17	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S4	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S5	46.40	0.00	0.00	2.45	42.74	0.01	18.30	0.921
S7	46.40	0.00	0.00	2.45	42.74	0.01	18.30	0.921
S9	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S11	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S27	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S26	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S25	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S3	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S20	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S18	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S1	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S6	46.40	0.00	0.00	2.45	42.74	0.01	18.30	0.921
S8	46.40	0.00	0.00	2.45	42.74	0.01	18.30	0.921
S10	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S12	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S14	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S16	46.40	0.00	0.00	2.51	42.63	0.07	139.13	0.919
S13	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S15	46.40	0.00	0.00	2.51	42.63	0.07	139.13	0.919
S28	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S29	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S30	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S31	46.40	0.00	0.00	2.45	42.75	0.01	24.45	0.921
S33	46.40	0.00	0.00	2.45	42.76	0.01	18.36	0.921
S34	46.40	0.00	0.00	2.45	42.76	0.01	18.36	0.921
S2	46.40	0.00	0.00	2.45	42.76	0.01	12.24	0.921
S22	46.40	0.00	0.00	2.45	42.76	0.01	15.30	0.921
S32	46.40	0.00	0.00	2.45	42.75	0.02	36.68	0.921

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.02	0.26	39.16	0 00:09
J24	JUNCTION	0.03	0.30	38.72	0 00:09
J23	JUNCTION	0.03	0.28	38.31	0 00:09
J22	JUNCTION	0.03	0.41	38.21	0 00:09
J21	JUNCTION	0.05	0.49	38.18	0 00:09
J19	JUNCTION	0.03	0.46	38.25	0 00:09

J18	JUNCTION	0.03	0.34	38.36	0	00:09
J17	JUNCTION	0.02	0.31	38.70	0	00:09
J15	JUNCTION	0.02	0.27	39.31	0	00:09
J13	JUNCTION	0.02	0.25	39.85	0	00:09
J12	JUNCTION	0.02	0.24	40.39	0	00:09
J11	JUNCTION	0.02	0.23	40.93	0	00:08
J10	JUNCTION	0.02	0.21	41.47	0	00:08
J173	JUNCTION	0.05	0.39	38.08	0	00:09
J174	JUNCTION	0.02	0.29	38.08	0	00:09
J175	JUNCTION	0.01	0.12	38.14	0	00:08
J176	JUNCTION	0.03	0.37	38.17	0	00:09
J177	JUNCTION	0.03	0.28	38.31	0	00:09
J178	JUNCTION	0.03	0.30	38.72	0	00:09
J179	JUNCTION	0.02	0.26	39.16	0	00:09
J180	JUNCTION	0.02	0.25	39.64	0	00:09
J181	JUNCTION	0.02	0.24	40.11	0	00:09
J184	JUNCTION	0.02	0.25	39.64	0	00:09
J185	JUNCTION	0.02	0.24	40.11	0	00:09
J187	JUNCTION	0.02	0.25	42.06	0	00:08
J188	JUNCTION	0.02	0.23	42.60	0	00:08
J189	JUNCTION	0.01	0.20	43.12	0	00:08
J190	JUNCTION	0.01	0.18	43.64	0	00:08
J191	JUNCTION	0.01	0.13	44.38	0	00:08
J193	JUNCTION	0.01	0.16	44.41	0	00:08
J194	JUNCTION	0.00	0.08	38.47	0	00:08
J195	JUNCTION	0.01	0.17	44.04	0	00:08
Out3	OUTFALL	0.10	0.10	35.29	0	00:07
1	STORAGE	0.67	0.92	36.11	0	00:22

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	12.24	160.43	0 00:09	0.005	0.078
J24	JUNCTION	12.24	170.94	0 00:09	0.005	0.083
J23	JUNCTION	18.30	186.13	0 00:09	0.008	0.090
J22	JUNCTION	18.30	201.56	0 00:09	0.008	0.098
J21	JUNCTION	24.48	524.21	0 00:09	0.010	0.248
J19	JUNCTION	12.24	304.30	0 00:09	0.005	0.140
J18	JUNCTION	12.24	293.82	0 00:09	0.005	0.134
J17	JUNCTION	15.30	283.09	0 00:09	0.006	0.129
J15	JUNCTION	24.45	269.81	0 00:09	0.010	0.123
J13	JUNCTION	24.45	248.15	0 00:08	0.010	0.113
J12	JUNCTION	24.45	227.38	0 00:08	0.010	0.102
J11	JUNCTION	24.45	206.25	0 00:08	0.010	0.092
J10	JUNCTION	24.45	184.46	0 00:08	0.010	0.082
J173	JUNCTION	24.48	255.56	0 00:09	0.010	0.125
J174	JUNCTION	12.24	39.05	0 00:08	0.005	0.017
J175	JUNCTION	12.24	27.46	0 00:08	0.005	0.012
J176	JUNCTION	18.30	201.56	0 00:09	0.008	0.098
J177	JUNCTION	18.30	186.13	0 00:09	0.008	0.090
J178	JUNCTION	12.24	170.94	0 00:09	0.005	0.083
J179	JUNCTION	12.24	160.43	0 00:09	0.005	0.078
J180	JUNCTION	12.24	149.96	0 00:09	0.005	0.072
J181	JUNCTION	139.13	139.13	0 00:09	0.067	0.067
J184	JUNCTION	12.24	149.96	0 00:09	0.005	0.072
J185	JUNCTION	139.13	139.13	0 00:09	0.067	0.067
J187	JUNCTION	24.45	163.03	0 00:08	0.010	0.072
J188	JUNCTION	24.45	141.10	0 00:08	0.010	0.061
J189	JUNCTION	24.45	118.65	0 00:08	0.010	0.051
J190	JUNCTION	24.45	95.66	0 00:08	0.010	0.041
J191	JUNCTION	18.36	36.54	0 00:08	0.008	0.015
J193	JUNCTION	18.36	18.36	0 00:08	0.008	0.008
J194	JUNCTION	15.30	15.30	0 00:08	0.006	0.006
J195	JUNCTION	36.68	72.55	0 00:08	0.015	0.031
Out3	OUTFALL	0.00	25.00	0 00:07	0.000	0.214
1	STORAGE	0.00	779.19	0 00:09	0.000	0.373

****
Node Surcharge Summary
****
No nodes were surcharged.

****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.247	27	0	0.340	37	0 00:22	25.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	98.13	24.82	25.00	0.214
System	98.13	24.82	25.00	0.214

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	25.00	0 00:07	0.78	0.58	0.60
C12	CONDUIT	247.65	0 00:09	2.09	0.37	0.44
C13	CONDUIT	269.42	0 00:09	1.99	0.42	0.48
C14	CONDUIT	283.04	0 00:09	1.83	0.52	0.54
C15	CONDUIT	293.61	0 00:09	1.30	0.45	0.57
C16	CONDUIT	303.09	0 00:09	1.08	0.71	0.68
C17	CONDUIT	201.21	0 00:09	0.77	0.45	0.65
C18	CONDUIT	185.88	0 00:09	1.12	0.43	0.57
C19	CONDUIT	170.45	0 00:09	1.77	0.90	0.72
C20	CONDUIT	160.37	0 00:09	1.71	0.76	0.70
C9	CONDUIT	182.36	0 00:08	1.92	0.27	0.37
C10	CONDUIT	203.93	0 00:08	1.99	0.31	0.39
C11	CONDUIT	225.66	0 00:09	2.06	0.34	0.41
C164	CONDUIT	524.05	0 00:09	1.89	8.64	0.68
C25	CONDUIT	26.83	0 00:08	0.65	0.18	0.51
C26	CONDUIT	34.54	0 00:09	0.36	0.12	0.57
C22	CONDUIT	139.09	0 00:09	1.74	0.66	0.61
C21	CONDUIT	149.73	0 00:09	1.77	0.71	0.64
C31	CONDUIT	149.73	0 00:09	1.77	0.71	0.64
C30	CONDUIT	160.37	0 00:09	1.71	0.76	0.70
C29	CONDUIT	170.45	0 00:09	1.77	0.90	0.72
C28	CONDUIT	185.88	0 00:09	1.20	0.43	0.54
C27	CONDUIT	200.78	0 00:09	1.06	0.68	0.64
C2	CONDUIT	18.18	0 00:08	0.44	2.43	0.36
C5	CONDUIT	94.32	0 00:08	1.57	0.42	0.48
C6	CONDUIT	116.85	0 00:08	1.69	0.52	0.54
C7	CONDUIT	138.91	0 00:08	1.76	0.61	0.60
C8	CONDUIT	161.04	0 00:08	2.12	0.72	0.58
C32	CONDUIT	139.09	0 00:09	1.74	0.66	0.61
C202	CONDUIT	255.16	0 00:09	1.64	10.31	0.74
C203	CONDUIT	15.22	0 00:08	0.65	0.08	0.24
C204	CONDUIT	71.27	0 00:08	1.35	0.37	0.44
C205	CONDUIT	35.89	0 00:08	0.83	0.24	0.37

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.14	0.0000
C12	1.00	0.01	0.00	0.00	0.78	0.21	0.00	0.69	0.0000

C13	1.00	0.01	0.00	0.00	0.83	0.16	0.00	0.00	0.63	0.0000
C14	1.00	0.01	0.00	0.00	0.88	0.11	0.00	0.00	0.58	0.0001
C15	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.38	0.0001
C16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.13	0.0001
C17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.22	0.0001
C18	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.54	0.0000
C19	1.00	0.01	0.00	0.00	0.80	0.19	0.00	0.00	0.83	0.0001
C20	1.00	0.01	0.00	0.00	0.72	0.27	0.00	0.00	0.83	0.0001
C9	1.00	0.01	0.00	0.00	0.81	0.18	0.00	0.00	0.66	0.0000
C10	1.00	0.01	0.00	0.00	0.80	0.19	0.00	0.00	0.67	0.0000
C11	1.00	0.01	0.00	0.00	0.78	0.21	0.00	0.00	0.69	0.0000
C164	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.48	0.0010
C25	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.12	0.0000
C26	1.00	0.01	0.39	0.00	0.60	0.00	0.00	0.00	0.02	0.0000
C22	1.00	0.01	0.00	0.00	0.65	0.34	0.00	0.00	0.86	0.0001
C21	1.00	0.01	0.00	0.00	0.64	0.35	0.00	0.00	0.87	0.0001
C31	1.00	0.01	0.00	0.00	0.64	0.35	0.00	0.00	0.87	0.0001
C30	1.00	0.01	0.00	0.00	0.72	0.27	0.00	0.00	0.83	0.0001
C29	1.00	0.01	0.00	0.00	0.80	0.19	0.00	0.00	0.83	0.0001
C28	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.51	0.0000
C27	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.25	0.0001
C2	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.11	0.0003
C5	1.00	0.01	0.00	0.00	0.86	0.13	0.00	0.00	0.59	0.0000
C6	1.00	0.01	0.00	0.00	0.84	0.15	0.00	0.00	0.61	0.0001
C7	1.00	0.01	0.00	0.00	0.82	0.17	0.00	0.00	0.61	0.0001
C8	1.00	0.01	0.00	0.00	0.72	0.27	0.00	0.00	0.76	0.0001
C32	1.00	0.01	0.00	0.00	0.65	0.34	0.00	0.00	0.86	0.0001
C202	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.46	0.0012
C203	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.13	0.0000
C204	1.00	0.01	0.00	0.00	0.90	0.09	0.00	0.00	0.54	0.0000
C205	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.42	0.0000

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C164	0.01	0.01	0.01	0.21	0.01
C2	0.01	0.01	0.01	0.14	0.01
C202	0.01	0.01	0.01	0.23	0.01

- <u>Durata 30' – T_R100anni</u>

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 02:30:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec

```
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m          mm
**************************    ---------       -------
Total Precipitation ......        0.051        58.590
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.002         2.475
Surface Runoff ...........        0.048        54.836
Final Surface Storage ....        0.001         1.280
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.048         0.479
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.021         0.208
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.027         0.271
Continuity Error (%) .....        0.016
**************************
Time-Step Critical Elements
***************************
Link C57 (96.40%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
*************************
Minimum Time Step          :     0.50 sec
Average Time Step          :     0.52 sec
Maximum Time Step          :     1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S24	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S23	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S21	58.59	0.00	0.00	2.47	54.85	0.01	9.39	0.936
S19	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S17	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S4	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S5	58.59	0.00	0.00	2.47	54.85	0.01	11.26	0.936
S7	58.59	0.00	0.00	2.47	54.85	0.01	11.26	0.936
S9	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S11	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S27	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S26	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S25	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S3	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S20	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S18	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S1	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S6	58.59	0.00	0.00	2.47	54.85	0.01	11.26	0.936
S8	58.59	0.00	0.00	2.47	54.85	0.01	11.26	0.936
S10	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S12	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S14	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S16	58.59	0.00	0.00	2.49	54.81	0.09	95.25	0.935
S13	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S15	58.59	0.00	0.00	2.49	54.81	0.09	95.25	0.935
S28	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S29	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S30	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936

S31	58.59	0.00	0.00	2.47	54.85	0.01	15.02	0.936
S33	58.59	0.00	0.00	2.47	54.85	0.01	11.26	0.936
S34	58.59	0.00	0.00	2.47	54.85	0.01	11.26	0.936
S2	58.59	0.00	0.00	2.47	54.85	0.01	7.51	0.936
S22	58.59	0.00	0.00	2.47	54.85	0.01	9.39	0.936
S32	58.59	0.00	0.00	2.47	54.85	0.02	22.53	0.936

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.03	0.21	39.11	0 00:17
J24	JUNCTION	0.04	0.23	38.65	0 00:17
J23	JUNCTION	0.04	0.22	38.25	0 00:17
J22	JUNCTION	0.05	0.32	38.12	0 00:17
J21	JUNCTION	0.07	0.40	38.09	0 00:17
J19	JUNCTION	0.05	0.36	38.15	0 00:17
J18	JUNCTION	0.04	0.26	38.28	0 00:17
J17	JUNCTION	0.03	0.24	38.63	0 00:17
J15	JUNCTION	0.03	0.22	39.26	0 00:17
J13	JUNCTION	0.03	0.20	39.80	0 00:17
J12	JUNCTION	0.03	0.19	40.34	0 00:17
J11	JUNCTION	0.03	0.18	40.88	0 00:17
J10	JUNCTION	0.02	0.17	41.43	0 00:17
J173	JUNCTION	0.06	0.32	38.01	0 00:17
J174	JUNCTION	0.03	0.22	38.01	0 00:18
J175	JUNCTION	0.01	0.09	38.11	0 00:17
J176	JUNCTION	0.05	0.29	38.09	0 00:17
J177	JUNCTION	0.04	0.22	38.25	0 00:17
J178	JUNCTION	0.04	0.23	38.65	0 00:17
J179	JUNCTION	0.03	0.21	39.11	0 00:17
J180	JUNCTION	0.03	0.20	39.59	0 00:17
J181	JUNCTION	0.03	0.19	40.06	0 00:17
J184	JUNCTION	0.03	0.20	39.59	0 00:17
J185	JUNCTION	0.03	0.19	40.06	0 00:17
J187	JUNCTION	0.03	0.19	42.00	0 00:17
J188	JUNCTION	0.02	0.17	42.54	0 00:17
J189	JUNCTION	0.02	0.16	43.08	0 00:17
J190	JUNCTION	0.02	0.14	43.60	0 00:17
J191	JUNCTION	0.01	0.10	44.35	0 00:17
J193	JUNCTION	0.02	0.13	44.38	0 00:17
J194	JUNCTION	0.01	0.06	38.45	0 00:17
J195	JUNCTION	0.02	0.13	44.00	0 00:17
Out3	OUTFALL	0.10	0.10	35.29	0 00:12
1	STORAGE	0.89	1.17	36.36	0 00:36

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	7.51	109.53	0 00:17	0.007	0.100
J24	JUNCTION	7.51	116.54	0 00:17	0.007	0.106
J23	JUNCTION	11.26	127.25	0 00:17	0.010	0.116
J22	JUNCTION	11.26	137.82	0 00:17	0.010	0.126
J21	JUNCTION	15.02	351.61	0 00:17	0.013	0.319
J19	JUNCTION	7.51	200.58	0 00:17	0.007	0.179
J18	JUNCTION	7.51	193.70	0 00:17	0.007	0.173
J17	JUNCTION	9.39	186.56	0 00:17	0.008	0.166
J15	JUNCTION	15.02	177.73	0 00:17	0.013	0.158
J13	JUNCTION	15.02	163.24	0 00:17	0.013	0.145
J12	JUNCTION	15.02	148.69	0 00:17	0.013	0.132
J11	JUNCTION	15.02	134.06	0 00:17	0.013	0.118
J10	JUNCTION	15.02	119.31	0 00:17	0.013	0.105
J173	JUNCTION	15.02	174.98	0 00:17	0.013	0.161
J174	JUNCTION	7.51	24.36	0 00:17	0.007	0.021
J175	JUNCTION	7.51	16.89	0 00:17	0.007	0.015
J176	JUNCTION	11.26	137.82	0 00:17	0.010	0.126
J177	JUNCTION	11.26	127.25	0 00:17	0.010	0.116

J178	JUNCTION	7.51	116.54	0	00:17	0.007	0.106
J179	JUNCTION	7.51	109.53	0	00:17	0.007	0.100
J180	JUNCTION	7.51	102.50	0	00:17	0.007	0.093
J181	JUNCTION	95.24	95.24	0	00:17	0.087	0.087
J184	JUNCTION	7.51	102.50	0	00:17	0.007	0.093
J185	JUNCTION	95.24	95.24	0	00:17	0.087	0.087
J187	JUNCTION	15.02	104.54	0	00:17	0.013	0.092
J188	JUNCTION	15.02	89.72	0	00:17	0.013	0.079
J189	JUNCTION	15.02	74.85	0	00:17	0.013	0.066
J190	JUNCTION	15.02	59.93	0	00:17	0.013	0.053
J191	JUNCTION	11.26	22.52	0	00:17	0.010	0.020
J193	JUNCTION	11.26	11.26	0	00:17	0.010	0.010
J194	JUNCTION	9.39	9.39	0	00:17	0.008	0.008
J195	JUNCTION	22.53	45.00	0	00:17	0.020	0.039
Out3	OUTFALL	0.00	25.00	0	00:12	0.000	0.208
1	STORAGE	0.00	526.29	0	00:17	0.000	0.479

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.330	36	0	0.432	47	0 00:36	25.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	96.91	24.72	25.00	0.208
System	96.91	24.72	25.00	0.208

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	25.00	0 00:12	0.79	0.58	0.60
C12	CONDUIT	163.04	0 00:17	1.86	0.24	0.35
C13	CONDUIT	177.50	0 00:17	1.79	0.28	0.38
C14	CONDUIT	186.55	0 00:17	1.65	0.34	0.42
C15	CONDUIT	193.49	0 00:17	1.18	0.30	0.44
C16	CONDUIT	200.21	0 00:17	0.94	0.47	0.54
C17	CONDUIT	137.33	0 00:17	0.69	0.31	0.51
C18	CONDUIT	127.13	0 00:17	1.04	0.30	0.45
C19	CONDUIT	116.50	0 00:17	1.59	0.62	0.56
C20	CONDUIT	109.35	0 00:17	1.58	0.52	0.54
C9	CONDUIT	119.15	0 00:17	1.71	0.18	0.30
C10	CONDUIT	133.84	0 00:17	1.77	0.20	0.31
C11	CONDUIT	148.47	0 00:17	1.83	0.22	0.33
C164	CONDUIT	351.48	0 00:17	1.62	5.79	0.55
C25	CONDUIT	16.85	0 00:17	0.53	0.12	0.39
C26	CONDUIT	23.29	0 00:17	0.27	0.08	0.45
C22	CONDUIT	95.07	0 00:17	1.59	0.45	0.48
C21	CONDUIT	102.24	0 00:17	1.62	0.48	0.50
C31	CONDUIT	102.24	0 00:17	1.62	0.48	0.50
C30	CONDUIT	109.35	0 00:17	1.58	0.52	0.54
C29	CONDUIT	116.50	0 00:17	1.59	0.62	0.56
C28	CONDUIT	127.13	0 00:17	1.09	0.30	0.43
C27	CONDUIT	137.66	0 00:17	0.95	0.47	0.51

C2	CONDUIT	11.25	0	00:17	0.37	1.51	0.29
C5	CONDUIT	59.84	0	00:17	1.39	0.27	0.38
C6	CONDUIT	74.73	0	00:17	1.50	0.33	0.42
C7	CONDUIT	89.56	0	00:17	1.58	0.40	0.46
C8	CONDUIT	104.41	0	00:17	1.87	0.47	0.46
C32	CONDUIT	95.07	0	00:17	1.59	0.45	0.48
C202	CONDUIT	174.82	0	00:17	1.41	7.07	0.61
C203	CONDUIT	9.38	0	00:17	0.56	0.05	0.19
C204	CONDUIT	44.92	0	00:17	1.19	0.23	0.34
C205	CONDUIT	22.48	0	00:17	0.73	0.15	0.29

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
		--- Fraction of Time in Flow Class ----							
C57	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.15	0.0000
C12	1.00	0.02	0.00	0.00	0.69	0.29	0.00	0.81	0.0000
C13	1.00	0.02	0.00	0.00	0.74	0.24	0.00	0.75	0.0000
C14	1.00	0.02	0.00	0.00	0.79	0.19	0.00	0.67	0.0000
C15	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.45	0.0000
C16	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.18	0.0001
C17	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.25	0.0000
C18	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.58	0.0000
C19	1.00	0.02	0.00	0.00	0.72	0.26	0.00	0.89	0.0001
C20	1.00	0.02	0.00	0.00	0.64	0.34	0.00	0.91	0.0001
C9	1.00	0.02	0.00	0.00	0.72	0.26	0.00	0.79	0.0000
C10	1.00	0.02	0.00	0.00	0.71	0.28	0.00	0.79	0.0000
C11	1.00	0.02	0.00	0.00	0.69	0.29	0.00	0.81	0.0000
C164	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.54	0.0007
C25	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.17	0.0000
C26	1.00	0.02	0.28	0.00	0.71	0.00	0.00	0.00	0.04	0.0000
C22	1.00	0.02	0.00	0.00	0.56	0.42	0.00	0.00	0.95	0.0001
C21	1.00	0.02	0.00	0.00	0.54	0.44	0.00	0.00	0.96	0.0001
C31	1.00	0.02	0.00	0.00	0.54	0.44	0.00	0.00	0.96	0.0001
C30	1.00	0.02	0.00	0.00	0.64	0.34	0.00	0.00	0.91	0.0001
C29	1.00	0.02	0.00	0.00	0.72	0.26	0.00	0.00	0.89	0.0001
C28	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.56	0.0000
C27	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.29	0.0001
C2	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.13	0.0002
C5	1.00	0.02	0.00	0.00	0.77	0.21	0.00	0.00	0.70	0.0000
C6	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.00	0.72	0.0000
C7	1.00	0.02	0.00	0.00	0.73	0.26	0.00	0.00	0.72	0.0000
C8	1.00	0.02	0.00	0.00	0.61	0.37	0.00	0.00	0.88	0.0001
C32	1.00	0.02	0.00	0.00	0.56	0.42	0.00	0.00	0.95	0.0001
C202	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.51	0.0008
C203	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.20	0.0000
C204	1.00	0.02	0.00	0.00	0.81	0.17	0.00	0.00	0.62	0.0000
C205	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.47	0.0000

****
Conduit Surcharge Summary
****

Conduit	Hours Both Ends Full	Hours Upstream Full	Hours Dnstream Full	Hours Above Full Normal Flow	Capacity Limited
	--------- Hours Full --------				
C164	0.01	0.01	0.01	0.38	0.01
C2	0.01	0.01	0.01	0.18	0.01
C202	0.01	0.01	0.01	0.40	0.01

- <u>Durata 45' – T_R100anni</u>

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

```
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.059        67.290
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.002         2.481
Surface Runoff ...........         0.056        63.525
Final Surface Storage ....         0.001         1.284
Continuity Error (%) .....         0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.056         0.555
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.020         0.202
Internal Outflow .........         0.000         0.000
Storage Losses ...........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.035         0.353
Continuity Error (%) .....         0.023
**************************
Time-Step Critical Elements
**************************
Link C57 (95.16%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.53 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
**************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------------
                    Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
Subcatchment            mm        mm        mm        mm        mm    10^6 ltr      LPS
-----------------------------------------------------------------------------------------------------
S24                  67.29      0.00      0.00      2.48     63.54      0.02    11.51   0.944
S23                  67.29      0.00      0.00      2.48     63.54      0.02    11.51   0.944
S21                  67.29      0.00      0.00      2.48     63.54      0.01     7.20   0.944
S19                  67.29      0.00      0.00      2.48     63.54      0.01     5.76   0.944
S17                  67.29      0.00      0.00      2.48     63.54      0.01     5.76   0.944
S4                   67.29      0.00      0.00      2.48     63.54      0.01     5.76   0.944
S5                   67.29      0.00      0.00      2.48     63.54      0.01     8.63   0.944
S7                   67.29      0.00      0.00      2.48     63.54      0.01     8.63   0.944
```

S9	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S11	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S27	67.29	0.00	0.00	2.48	63.54	0.02	11.51	0.944
S26	67.29	0.00	0.00	2.48	63.54	0.02	11.51	0.944
S25	67.29	0.00	0.00	2.48	63.54	0.02	11.51	0.944
S3	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S20	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S18	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S1	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S6	67.29	0.00	0.00	2.48	63.54	0.01	8.63	0.944
S8	67.29	0.00	0.00	2.48	63.54	0.01	8.63	0.944
S10	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S12	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S14	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S16	67.29	0.00	0.00	2.49	63.50	0.10	74.52	0.944
S13	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S15	67.29	0.00	0.00	2.49	63.50	0.10	74.52	0.944
S28	67.29	0.00	0.00	2.48	63.54	0.02	11.51	0.944
S29	67.29	0.00	0.00	2.48	63.54	0.02	11.51	0.944
S30	67.29	0.00	0.00	2.48	63.54	0.02	11.51	0.944
S31	67.29	0.00	0.00	2.48	63.54	0.02	11.51	0.944
S33	67.29	0.00	0.00	2.48	63.54	0.01	8.64	0.944
S34	67.29	0.00	0.00	2.48	63.54	0.01	8.64	0.944
S2	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S22	67.29	0.00	0.00	2.48	63.54	0.01	7.20	0.944
S32	67.29	0.00	0.00	2.48	63.54	0.02	17.27	0.944

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.04	0.18	39.08	0 00:25
J24	JUNCTION	0.04	0.20	38.62	0 00:25
J23	JUNCTION	0.05	0.20	38.23	0 00:25
J22	JUNCTION	0.06	0.27	38.07	0 00:25
J21	JUNCTION	0.09	0.35	38.04	0 00:26
J19	JUNCTION	0.06	0.31	38.10	0 00:25
J18	JUNCTION	0.05	0.23	38.25	0 00:25
J17	JUNCTION	0.04	0.21	38.60	0 00:25
J15	JUNCTION	0.04	0.19	39.23	0 00:25
J13	JUNCTION	0.04	0.18	39.78	0 00:25
J12	JUNCTION	0.03	0.17	40.32	0 00:25
J11	JUNCTION	0.03	0.16	40.86	0 00:25
J10	JUNCTION	0.03	0.15	41.41	0 00:25
J173	JUNCTION	0.07	0.28	37.97	0 00:25
J174	JUNCTION	0.03	0.19	37.98	0 00:25
J175	JUNCTION	0.02	0.08	38.10	0 00:25
J176	JUNCTION	0.06	0.25	38.05	0 00:25
J177	JUNCTION	0.05	0.20	38.23	0 00:25
J178	JUNCTION	0.04	0.20	38.62	0 00:25
J179	JUNCTION	0.04	0.18	39.08	0 00:25
J180	JUNCTION	0.04	0.17	39.56	0 00:25
J181	JUNCTION	0.04	0.16	40.03	0 00:25
J184	JUNCTION	0.04	0.17	39.56	0 00:25
J185	JUNCTION	0.04	0.16	40.03	0 00:25
J187	JUNCTION	0.03	0.17	41.98	0 00:25
J188	JUNCTION	0.03	0.15	42.52	0 00:25
J189	JUNCTION	0.03	0.14	43.06	0 00:25
J190	JUNCTION	0.02	0.12	43.58	0 00:25
J191	JUNCTION	0.02	0.09	44.34	0 00:25
J193	JUNCTION	0.03	0.11	44.36	0 00:25
J194	JUNCTION	0.01	0.05	38.44	0 00:25
J195	JUNCTION	0.02	0.11	43.98	0 00:25
Out3	OUTFALL	0.10	0.10	35.29	0 00:16
1	STORAGE	1.01	1.33	36.52	0 00:50

****
Node Inflow Summary
****

	Maximum Lateral Inflow	Maximum Total Inflow	Time of Max Occurrence	Lateral Inflow Volume	Total Inflow Volume

Node	Type	LPS	LPS	days hr:min	10^6 ltr	10^6 ltr
J25	JUNCTION	5.76	85.75	0 00:25	0.008	0.116
J24	JUNCTION	5.76	91.29	0 00:25	0.008	0.123
J23	JUNCTION	8.63	99.68	0 00:25	0.011	0.135
J22	JUNCTION	8.63	108.03	0 00:25	0.011	0.146
J21	JUNCTION	11.51	274.15	0 00:25	0.015	0.369
J19	JUNCTION	5.76	155.68	0 00:25	0.008	0.208
J18	JUNCTION	5.76	150.22	0 00:25	0.008	0.200
J17	JUNCTION	7.20	144.71	0 00:25	0.010	0.193
J15	JUNCTION	11.51	137.69	0 00:25	0.015	0.183
J13	JUNCTION	11.51	126.29	0 00:25	0.015	0.168
J12	JUNCTION	11.51	114.87	0 00:25	0.015	0.152
J11	JUNCTION	11.51	103.43	0 00:25	0.015	0.137
J10	JUNCTION	11.51	91.97	0 00:25	0.015	0.122
J173	JUNCTION	11.51	137.21	0 00:25	0.015	0.186
J174	JUNCTION	5.76	18.70	0 00:25	0.008	0.025
J175	JUNCTION	5.76	12.95	0 00:25	0.008	0.017
J176	JUNCTION	8.63	108.03	0 00:25	0.011	0.146
J177	JUNCTION	8.63	99.68	0 00:25	0.011	0.135
J178	JUNCTION	5.76	91.29	0 00:25	0.008	0.123
J179	JUNCTION	5.76	85.75	0 00:25	0.008	0.116
J180	JUNCTION	5.76	80.18	0 00:25	0.008	0.108
J181	JUNCTION	74.52	74.52	0 00:25	0.100	0.100
J184	JUNCTION	5.76	80.18	0 00:25	0.008	0.108
J185	JUNCTION	74.52	74.52	0 00:25	0.100	0.100
J187	JUNCTION	11.51	80.50	0 00:25	0.015	0.107
J188	JUNCTION	11.51	69.02	0 00:25	0.015	0.091
J189	JUNCTION	11.51	57.53	0 00:25	0.015	0.076
J190	JUNCTION	11.51	46.03	0 00:25	0.015	0.061
J191	JUNCTION	8.64	17.27	0 00:25	0.011	0.023
J193	JUNCTION	8.64	8.64	0 00:25	0.011	0.011
J194	JUNCTION	7.20	7.20	0 00:25	0.010	0.010
J195	JUNCTION	17.27	34.53	0 00:25	0.023	0.046
Out3	OUTFALL	0.00	25.00	0 00:16	0.000	0.202
1	STORAGE	0.00	411.15	0 00:26	0.000	0.555

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.375	41	0	0.492	53	0 00:50	25.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	95.82	24.62	25.00	0.202
System	95.82	24.62	25.00	0.202

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	25.00	0 00:16	0.79	0.58	0.60
C12	CONDUIT	126.20	0 00:25	1.73	0.19	0.30
C13	CONDUIT	137.56	0 00:25	1.67	0.21	0.33

C14	CONDUIT	144.56	0	00:25	1.53	0.27	0.37
C15	CONDUIT	150.09	0	00:25	1.11	0.23	0.38
C16	CONDUIT	155.47	0	00:25	0.87	0.37	0.47
C17	CONDUIT	107.75	0	00:25	0.65	0.24	0.44
C18	CONDUIT	99.58	0	00:25	0.99	0.23	0.39
C19	CONDUIT	91.23	0	00:25	1.49	0.48	0.49
C20	CONDUIT	85.64	0	00:25	1.49	0.41	0.47
C9	CONDUIT	91.93	0	00:25	1.58	0.14	0.26
C10	CONDUIT	103.37	0	00:25	1.64	0.16	0.27
C11	CONDUIT	114.80	0	00:25	1.70	0.17	0.29
C164	CONDUIT	274.06	0	00:26	1.48	4.52	0.48
C25	CONDUIT	12.95	0	00:25	0.48	0.09	0.33
C26	CONDUIT	18.30	0	00:25	0.24	0.06	0.39
C22	CONDUIT	74.44	0	00:25	1.49	0.35	0.42
C21	CONDUIT	80.05	0	00:25	1.52	0.38	0.44
C31	CONDUIT	80.05	0	00:25	1.52	0.38	0.44
C30	CONDUIT	85.64	0	00:25	1.49	0.41	0.47
C29	CONDUIT	91.23	0	00:25	1.49	0.48	0.49
C28	CONDUIT	99.58	0	00:25	1.03	0.23	0.38
C27	CONDUIT	107.88	0	00:25	0.88	0.36	0.45
C2	CONDUIT	8.63	0	00:25	0.34	1.16	0.26
C5	CONDUIT	46.01	0	00:25	1.29	0.21	0.33
C6	CONDUIT	57.50	0	00:25	1.40	0.26	0.36
C7	CONDUIT	68.98	0	00:25	1.48	0.30	0.40
C8	CONDUIT	80.46	0	00:25	1.73	0.36	0.40
C32	CONDUIT	74.44	0	00:25	1.49	0.35	0.42
C202	CONDUIT	137.10	0	00:25	1.28	5.54	0.53
C203	CONDUIT	7.20	0	00:25	0.52	0.04	0.17
C204	CONDUIT	34.52	0	00:25	1.10	0.18	0.30
C205	CONDUIT	17.26	0	00:25	0.68	0.11	0.26

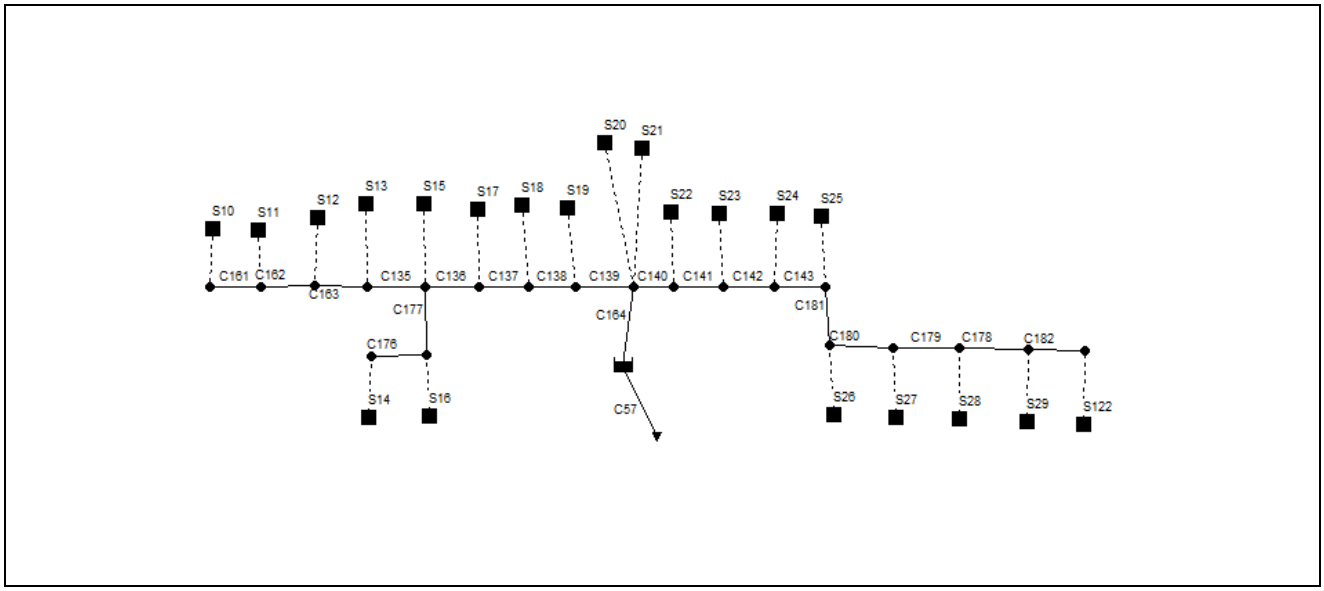
****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.15	0.0000
C12	1.00	0.03	0.00	0.00	0.59	0.38	0.00	0.93	0.0000
C13	1.00	0.03	0.00	0.00	0.64	0.33	0.00	0.85	0.0000
C14	1.00	0.03	0.00	0.00	0.70	0.27	0.00	0.76	0.0000
C15	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.51	0.0000
C16	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.23	0.0000
C17	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.28	0.0000
C18	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.62	0.0000
C19	1.00	0.03	0.00	0.00	0.63	0.34	0.00	0.93	0.0001
C20	1.00	0.03	0.00	0.00	0.55	0.43	0.00	0.96	0.0000
C9	1.00	0.03	0.00	0.00	0.62	0.35	0.00	0.90	0.0000
C10	1.00	0.03	0.00	0.00	0.61	0.36	0.00	0.91	0.0000
C11	1.00	0.03	0.00	0.00	0.59	0.38	0.00	0.93	0.0000
C164	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.60	0.0005
C25	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.23	0.0000
C26	1.00	0.03	0.16	0.00	0.81	0.00	0.00	0.00	0.05	0.0000
C22	1.00	0.03	0.00	0.00	0.47	0.51	0.00	0.00	1.01	0.0000
C21	1.00	0.03	0.00	0.00	0.45	0.52	0.00	0.00	1.02	0.0000
C31	1.00	0.03	0.00	0.00	0.45	0.52	0.00	0.00	1.02	0.0000
C30	1.00	0.03	0.00	0.00	0.55	0.43	0.00	0.00	0.96	0.0000
C29	1.00	0.03	0.00	0.00	0.63	0.34	0.00	0.00	0.93	0.0001
C28	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.59	0.0000
C27	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.33	0.0000
C2	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.16	0.0001
C5	1.00	0.03	0.00	0.00	0.68	0.30	0.00	0.00	0.79	0.0000
C6	1.00	0.03	0.00	0.00	0.65	0.32	0.00	0.00	0.82	0.0000
C7	1.00	0.03	0.00	0.00	0.63	0.34	0.00	0.00	0.82	0.0000
C8	1.00	0.03	0.00	0.00	0.51	0.46	0.00	0.00	1.01	0.0000
C32	1.00	0.03	0.00	0.00	0.47	0.51	0.00	0.00	1.01	0.0000
C202	1.00	0.03	0.00	0.00	0.00	0.00	0.00	0.97	0.56	0.0006
C203	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.27	0.0000
C204	1.00	0.03	0.00	0.00	0.71	0.26	0.00	0.00	0.71	0.0000
C205	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.51	0.0000

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Hours Above Full Dnstream	Hours Capacity Normal Flow	Limited
C164	0.01	0.01	0.01	0.54	0.01
C2	0.01	0.01	0.01	0.12	0.01
C202	0.01	0.01	0.01	0.57	0.01

ST04 – SOTTOPASSO DI VIA K.MARX



- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.016        43.668
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.001         2.441
Surface Runoff ...........         0.015        39.959
Final Surface Storage ....         0.000         1.270
Continuity Error (%) .....         0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.015         0.149
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

External Inflow 0.000 0.000
External Outflow 0.013 0.129
Internal Outflow 0.000 0.000
Storage Losses 0.000 0.000
Initial Stored Volume 0.000 0.000
Final Stored Volume 0.002 0.020
Continuity Error (%) 0.000
****
Time-Step Critical Elements
****
Link C57 (97.88%)
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 0.53 sec
Maximum Time Step : 1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S13	43.67	0.00	0.00	2.44	39.96	0.00	11.60	0.915
S15	43.67	0.00	0.00	2.44	39.96	0.00	11.60	0.915
S17	43.67	0.00	0.00	2.44	39.96	0.01	18.55	0.915
S18	43.67	0.00	0.00	2.44	39.96	0.01	18.55	0.915
S19	43.67	0.00	0.00	2.44	39.96	0.01	18.55	0.915
S21	43.67	0.00	0.00	2.45	39.95	0.01	29.58	0.915
S22	43.67	0.00	0.00	2.45	39.95	0.01	29.58	0.915
S23	43.67	0.00	0.00	2.44	39.96	0.01	19.48	0.915
S24	43.67	0.00	0.00	2.44	39.96	0.01	19.48	0.915
S25	43.67	0.00	0.00	2.44	39.96	0.00	8.35	0.915
S10	43.67	0.00	0.00	2.44	39.96	0.01	13.91	0.915
S11	43.67	0.00	0.00	2.44	39.96	0.01	13.91	0.915
S12	43.67	0.00	0.00	2.44	39.96	0.01	18.55	0.915
S20	43.67	0.00	0.00	2.44	39.96	0.01	18.55	0.915
S16	43.67	0.00	0.00	2.44	39.96	0.00	11.59	0.915
S14	43.67	0.00	0.00	2.44	39.96	0.00	11.60	0.915
S26	43.67	0.00	0.00	2.44	39.96	0.00	8.35	0.915
S27	43.67	0.00	0.00	2.44	39.96	0.01	18.55	0.915
S28	43.67	0.00	0.00	2.44	39.96	0.01	18.55	0.915
S29	43.67	0.00	0.00	2.44	39.96	0.01	13.91	0.915
S122	43.67	0.00	0.00	2.44	39.96	0.01	13.91	0.915

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.01	0.13	42.37	0 00:08
J24	JUNCTION	0.01	0.15	40.82	0 00:08
J23	JUNCTION	0.02	0.21	39.75	0 00:08
J22	JUNCTION	0.02	0.30	39.60	0 00:09
J21	JUNCTION	0.04	0.41	39.56	0 00:09
J19	JUNCTION	0.02	0.35	39.60	0 00:09
J18	JUNCTION	0.02	0.30	39.65	0 00:09
J17	JUNCTION	0.01	0.18	40.23	0 00:08
J15	JUNCTION	0.01	0.14	41.54	0 00:08
J13	JUNCTION	0.01	0.11	43.26	0 00:08
J12	JUNCTION	0.01	0.10	45.03	0 00:08
J11	JUNCTION	0.00	0.08	46.37	0 00:08
J10	JUNCTION	0.00	0.06	46.90	0 00:08
J16	JUNCTION	0.02	0.17	41.57	0 00:08
J14	JUNCTION	0.00	0.05	43.20	0 00:08

J26	JUNCTION	0.02	0.23	42.47	0	00:08
J27	JUNCTION	0.01	0.12	43.52	0	00:08
J28	JUNCTION	0.01	0.10	44.95	0	00:08
J29	JUNCTION	0.01	0.08	45.81	0	00:08
J173	JUNCTION	0.00	0.06	46.61	0	00:08
Out3	OUTFALL	0.08	0.08	36.73	0	00:06
1	STORAGE	0.53	0.90	37.55	0	00:18

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	8.35	80.50	0 00:08	0.004	0.035
J24	JUNCTION	19.48	99.29	0 00:08	0.008	0.044
J23	JUNCTION	19.48	117.86	0 00:08	0.008	0.052
J22	JUNCTION	29.58	145.93	0 00:08	0.013	0.065
J21	JUNCTION	48.13	330.81	0 00:09	0.021	0.149
J19	JUNCTION	18.55	142.55	0 00:09	0.008	0.064
J18	JUNCTION	18.55	126.35	0 00:08	0.008	0.056
J17	JUNCTION	18.55	108.83	0 00:08	0.008	0.048
J15	JUNCTION	11.60	91.24	0 00:08	0.005	0.040
J13	JUNCTION	11.60	57.61	0 00:08	0.005	0.025
J12	JUNCTION	18.55	46.25	0 00:08	0.008	0.020
J11	JUNCTION	13.91	27.80	0 00:08	0.006	0.012
J10	JUNCTION	13.91	13.91	0 00:08	0.006	0.006
J16	JUNCTION	11.59	23.16	0 00:08	0.005	0.010
J14	JUNCTION	11.60	11.60	0 00:08	0.005	0.005
J26	JUNCTION	8.35	72.59	0 00:08	0.004	0.032
J27	JUNCTION	18.55	64.57	0 00:08	0.008	0.028
J28	JUNCTION	18.55	46.23	0 00:08	0.008	0.020
J29	JUNCTION	13.91	27.80	0 00:08	0.006	0.012
J173	JUNCTION	13.91	13.91	0 00:08	0.006	0.006
Out3	OUTFALL	0.00	15.00	0 00:06	0.000	0.129
1	STORAGE	0.00	330.05	0 00:09	0.000	0.149

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.080	21	0	0.135	36	0 00:18	15.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	98.22	14.92	15.00	0.129
System	98.22	14.92	15.00	0.129

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	15.00	0 00:06	0.67	0.35	0.58

C135	CONDUIT	57.32	0	00:08	1.74	0.16	0.31
C136	CONDUIT	90.91	0	00:08	1.92	0.26	0.40
C137	CONDUIT	108.58	0	00:08	1.39	0.43	0.60
C138	CONDUIT	125.08	0	00:09	0.81	0.44	0.54
C139	CONDUIT	141.77	0	00:09	0.75	0.50	0.64
C140	CONDUIT	144.36	0	00:09	0.83	0.42	0.59
C141	CONDUIT	117.46	0	00:08	1.04	0.27	0.42
C142	CONDUIT	99.06	0	00:08	1.76	0.32	0.46
C143	CONDUIT	80.41	0	00:08	2.04	0.22	0.35
C161	CONDUIT	13.89	0	00:08	0.95	0.05	0.17
C162	CONDUIT	27.71	0	00:08	1.39	0.08	0.22
C163	CONDUIT	46.05	0	00:08	1.82	0.13	0.26
C164	CONDUIT	330.05	0	00:09	1.68	8.20	0.66
C176	CONDUIT	11.57	0	00:08	0.62	0.03	0.28
C177	CONDUIT	22.62	0	00:08	0.50	3.03	0.39
C178	CONDUIT	27.69	0	00:08	1.31	0.10	0.23
C179	CONDUIT	46.06	0	00:08	1.71	0.13	0.27
C180	CONDUIT	64.33	0	00:08	1.24	0.19	0.43
C181	CONDUIT	72.45	0	00:08	1.35	9.69	0.44
C182	CONDUIT	13.89	0	00:08	0.93	0.04	0.18

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.14	0.0000
C135	1.00	0.01	0.19	0.00	0.65	0.15	0.00	0.33	0.0000
C136	1.00	0.01	0.00	0.00	0.73	0.26	0.00	0.87	0.0000
C137	1.00	0.01	0.00	0.00	0.94	0.05	0.00	0.58	0.0001
C138	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.31	0.0001
C139	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.12	0.0001
C140	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.13	0.0000
C141	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.42	0.0000
C142	1.00	0.01	0.00	0.00	0.79	0.20	0.00	0.82	0.0000
C143	1.00	0.01	0.00	0.00	0.62	0.36	0.00	1.01	0.0000
C161	1.00	0.01	0.00	0.00	0.91	0.08	0.00	0.22	0.0000
C162	1.00	0.01	0.00	0.00	0.85	0.14	0.00	0.32	0.0000
C163	1.00	0.01	0.00	0.00	0.80	0.19	0.00	0.40	0.0000
C164	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.37	0.0010
C176	1.00	0.01	0.69	0.00	0.30	0.00	0.00	0.05	0.0000
C177	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.15	0.0004
C178	1.00	0.01	0.00	0.00	0.86	0.13	0.00	0.30	0.0000
C179	1.00	0.01	0.00	0.00	0.81	0.18	0.00	0.38	0.0000
C180	1.00	0.01	0.60	0.00	0.34	0.05	0.00	0.12	0.0000
C181	1.00	0.01	0.00	0.00	0.92	0.06	0.00	0.22	0.0011
C182	1.00	0.01	0.00	0.00	0.91	0.08	0.00	0.21	0.0000

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C164	0.01	0.01	0.01	0.20	0.01
C177	0.01	0.01	0.01	0.15	0.01
C181	0.01	0.01	0.01	0.19	0.01

- <u>Durata 30' – T_R100anni</u>

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options

```
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.021        56.040
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.001         2.464
Surface Runoff ...........        0.020        52.307
Final Surface Storage ....        0.000         1.270
Continuity Error (%) .....        0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.020         0.196
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.013         0.126
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.007         0.070
Continuity Error (%) .....        0.000
**************************
Time-Step Critical Elements
**************************
Link C57 (96.67%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     0.50 sec
Average Time Step          :     0.52 sec
Maximum Time Step          :     1.00 sec
Percent in Steady State    :     0.00
Average Iterations per Step :    2.00
***************************
Subcatchment Runoff Summary
***************************
-----------------------------------------------------------------------------------------------------
                    Total     Total     Total     Total     Total     Total    Peak  Runoff
                   Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
Subcatchment           mm        mm        mm        mm        mm    10^6 ltr     LPS
-----------------------------------------------------------------------------------------------------
S13                  56.04      0.00      0.00      2.46     52.31      0.01     7.48   0.933
S15                  56.04      0.00      0.00      2.46     52.31      0.01     7.48   0.933
S17                  56.04      0.00      0.00      2.46     52.31      0.01    11.96   0.933
S18                  56.04      0.00      0.00      2.46     52.31      0.01    11.96   0.933
S19                  56.04      0.00      0.00      2.46     52.31      0.01    11.96   0.933
S21                  56.04      0.00      0.00      2.47     52.30      0.02    19.13   0.933
S22                  56.04      0.00      0.00      2.47     52.30      0.02    19.13   0.933
S23                  56.04      0.00      0.00      2.46     52.31      0.01    12.56   0.933
S24                  56.04      0.00      0.00      2.46     52.31      0.01    12.56   0.933
S25                  56.04      0.00      0.00      2.46     52.31      0.00     5.38   0.933
```

S10	56.04	0.00	0.00	2.46	52.31	0.01	8.97	0.933
S11	56.04	0.00	0.00	2.46	52.31	0.01	8.97	0.933
S12	56.04	0.00	0.00	2.46	52.31	0.01	11.96	0.933
S20	56.04	0.00	0.00	2.46	52.31	0.01	11.96	0.933
S16	56.04	0.00	0.00	2.46	52.31	0.01	7.48	0.933
S14	56.04	0.00	0.00	2.46	52.31	0.01	7.48	0.933
S26	56.04	0.00	0.00	2.46	52.31	0.00	5.38	0.933
S27	56.04	0.00	0.00	2.46	52.31	0.01	11.96	0.933
S28	56.04	0.00	0.00	2.46	52.31	0.01	11.96	0.933
S29	56.04	0.00	0.00	2.46	52.31	0.01	8.97	0.933
S122	56.04	0.00	0.00	2.46	52.31	0.01	8.97	0.933

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.01	0.10	42.34	0 00:17
J24	JUNCTION	0.02	0.12	40.79	0 00:17
J23	JUNCTION	0.02	0.17	39.71	0 00:17
J22	JUNCTION	0.03	0.22	39.52	0 00:17
J21	JUNCTION	0.05	0.34	39.49	0 00:17
J19	JUNCTION	0.03	0.27	39.52	0 00:17
J18	JUNCTION	0.03	0.23	39.58	0 00:17
J17	JUNCTION	0.02	0.15	40.20	0 00:17
J15	JUNCTION	0.01	0.11	41.51	0 00:17
J13	JUNCTION	0.01	0.09	43.24	0 00:17
J12	JUNCTION	0.01	0.08	45.01	0 00:17
J11	JUNCTION	0.01	0.06	46.35	0 00:17
J10	JUNCTION	0.01	0.05	46.89	0 00:17
J16	JUNCTION	0.02	0.14	41.54	0 00:17
J14	JUNCTION	0.01	0.04	43.19	0 00:17
J26	JUNCTION	0.03	0.19	42.43	0 00:17
J27	JUNCTION	0.01	0.09	43.49	0 00:17
J28	JUNCTION	0.01	0.08	44.93	0 00:17
J29	JUNCTION	0.01	0.07	45.80	0 00:17
J173	JUNCTION	0.01	0.05	46.60	0 00:17
Out3	OUTFALL	0.08	0.08	36.73	0 00:10
1	STORAGE	0.77	1.14	37.79	0 00:33

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	5.38	52.55	0 00:17	0.005	0.046
J24	JUNCTION	12.56	65.07	0 00:17	0.011	0.057
J23	JUNCTION	12.56	77.55	0 00:17	0.011	0.068
J22	JUNCTION	19.13	96.48	0 00:17	0.017	0.085
J21	JUNCTION	31.10	220.65	0 00:17	0.027	0.196
J19	JUNCTION	11.96	94.85	0 00:17	0.010	0.084
J18	JUNCTION	11.96	83.38	0 00:17	0.010	0.073
J17	JUNCTION	11.96	71.55	0 00:17	0.010	0.063
J15	JUNCTION	7.48	59.68	0 00:17	0.007	0.052
J13	JUNCTION	7.48	37.36	0 00:17	0.007	0.033
J12	JUNCTION	11.96	29.90	0 00:17	0.010	0.026
J11	JUNCTION	8.97	17.94	0 00:17	0.008	0.016
J10	JUNCTION	8.97	8.97	0 00:17	0.008	0.008
J16	JUNCTION	7.48	14.95	0 00:17	0.007	0.013
J14	JUNCTION	7.48	7.48	0 00:17	0.007	0.007
J26	JUNCTION	5.38	47.21	0 00:17	0.005	0.041
J27	JUNCTION	11.96	41.85	0 00:17	0.010	0.037
J28	JUNCTION	11.96	29.90	0 00:17	0.010	0.026
J29	JUNCTION	8.97	17.94	0 00:17	0.008	0.016
J173	JUNCTION	8.97	8.97	0 00:17	0.008	0.008
Out3	OUTFALL	0.00	15.00	0 00:10	0.000	0.126
1	STORAGE	0.00	220.30	0 00:17	0.000	0.196

****
Node Surcharge Summary
****

No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.116	31	0	0.171	46	0 00:33	15.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	97.12	14.88	15.00	0.126
System	97.12	14.88	15.00	0.126

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	15.00	0 00:10	0.67	0.35	0.58
C135	CONDUIT	37.33	0 00:17	1.54	0.10	0.25
C136	CONDUIT	59.60	0 00:17	1.71	0.17	0.32
C137	CONDUIT	71.44	0 00:17	1.25	0.28	0.46
C138	CONDUIT	83.03	0 00:17	0.76	0.29	0.41
C139	CONDUIT	94.48	0 00:17	0.67	0.33	0.50
C140	CONDUIT	95.90	0 00:17	0.75	0.28	0.46
C141	CONDUIT	77.38	0 00:17	0.98	0.18	0.32
C142	CONDUIT	65.00	0 00:17	1.55	0.21	0.37
C143	CONDUIT	52.52	0 00:17	1.81	0.14	0.28
C161	CONDUIT	8.97	0 00:17	0.84	0.03	0.14
C162	CONDUIT	17.94	0 00:17	1.23	0.05	0.17
C163	CONDUIT	29.88	0 00:17	1.60	0.08	0.21
C164	CONDUIT	220.30	0 00:17	1.44	5.48	0.53
C176	CONDUIT	7.47	0 00:17	0.50	0.02	0.23
C177	CONDUIT	14.87	0 00:17	0.43	1.99	0.32
C178	CONDUIT	17.93	0 00:17	1.15	0.06	0.18
C179	CONDUIT	29.88	0 00:17	1.51	0.08	0.21
C180	CONDUIT	41.83	0 00:17	1.06	0.12	0.35
C181	CONDUIT	47.18	0 00:17	1.15	6.31	0.36
C182	CONDUIT	8.97	0 00:17	0.81	0.03	0.14

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C57	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.10	0.0000
C135	1.00	0.02	0.16	0.00	0.59	0.23	0.00	0.49	0.0000
C136	1.00	0.02	0.00	0.00	0.64	0.34	0.00	0.97	0.0000
C137	1.00	0.02	0.00	0.00	0.84	0.14	0.00	0.63	0.0000
C138	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.34	0.0000
C139	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.16	0.0000
C140	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.17	0.0000
C141	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.46	0.0000
C142	1.00	0.02	0.00	0.00	0.70	0.28	0.00	0.90	0.0000
C143	1.00	0.02	0.00	0.00	0.53	0.45	0.00	1.13	0.0000
C161	1.00	0.02	0.00	0.00	0.82	0.16	0.00	0.34	0.0000
C162	1.00	0.02	0.00	0.00	0.76	0.22	0.00	0.47	0.0000
C163	1.00	0.02	0.00	0.00	0.71	0.27	0.00	0.58	0.0000

```
C164              1.00  0.02  0.00  0.00  0.00  0.00  0.00  0.98    0.43  0.0006
C176              1.00  0.02  0.57  0.00  0.40  0.00  0.00  0.00    0.08  0.0000
C177              1.00  0.02  0.00  0.00  0.98  0.00  0.00  0.00    0.17  0.0002
C178              1.00  0.02  0.00  0.00  0.77  0.21  0.00  0.00    0.44  0.0000
C179              1.00  0.02  0.00  0.00  0.72  0.26  0.00  0.00    0.55  0.0000
C180              1.00  0.02  0.48  0.00  0.42  0.08  0.00  0.00    0.19  0.0000
C181              1.00  0.02  0.00  0.00  0.86  0.12  0.00  0.00    0.29  0.0007
C182              1.00  0.02  0.00  0.00  0.82  0.16  0.00  0.00    0.32  0.0000
*************************
Conduit Surcharge Summary
*************************
-------------------------------------------------------------------------------
                                                Hours       Hours
                  --------- Hours Full --------   Above Full   Capacity
Conduit              Both Ends  Upstream  Dnstream   Normal Flow   Limited
-------------------------------------------------------------------------------
C164                    0.01      0.01      0.01      0.37         0.01
C177                    0.01      0.01      0.01      0.25         0.01
C181                    0.01      0.01      0.01      0.38         0.01
```

- Durata 45' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 02:30:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m          mm
*************************     ---------       -------
Total Precipitation ......        0.024        64.940
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.001         2.476
Surface Runoff ...........        0.023        61.195
Final Surface Storage ....        0.000         1.270
Continuity Error (%) .....        0.000
*************************        Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.023         0.229
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.012         0.123
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.011         0.106
Continuity Error (%) .....        0.020
```

****
Time-Step Critical Elements
****
Link C57 (95.47%)
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 0.53 sec
Maximum Time Step : 1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S13	64.94	0.00	0.00	2.47	61.20	0.01	5.79	0.942
S15	64.94	0.00	0.00	2.47	61.20	0.01	5.79	0.942
S17	64.94	0.00	0.00	2.48	61.20	0.01	9.26	0.942
S18	64.94	0.00	0.00	2.48	61.20	0.01	9.26	0.942
S19	64.94	0.00	0.00	2.48	61.20	0.01	9.26	0.942
S21	64.94	0.00	0.00	2.48	61.19	0.02	14.81	0.942
S22	64.94	0.00	0.00	2.48	61.19	0.02	14.81	0.942
S23	64.94	0.00	0.00	2.48	61.20	0.01	9.72	0.942
S24	64.94	0.00	0.00	2.48	61.20	0.01	9.72	0.942
S25	64.94	0.00	0.00	2.47	61.20	0.01	4.17	0.942
S10	64.94	0.00	0.00	2.48	61.20	0.01	6.94	0.942
S11	64.94	0.00	0.00	2.48	61.20	0.01	6.94	0.942
S12	64.94	0.00	0.00	2.48	61.20	0.01	9.26	0.942
S20	64.94	0.00	0.00	2.48	61.20	0.01	9.26	0.942
S16	64.94	0.00	0.00	2.48	61.20	0.01	5.79	0.942
S14	64.94	0.00	0.00	2.47	61.20	0.01	5.79	0.942
S26	64.94	0.00	0.00	2.47	61.20	0.01	4.17	0.942
S27	64.94	0.00	0.00	2.48	61.20	0.01	9.26	0.942
S28	64.94	0.00	0.00	2.48	61.20	0.01	9.26	0.942
S29	64.94	0.00	0.00	2.48	61.20	0.01	6.94	0.942
S122	64.94	0.00	0.00	2.48	61.20	0.01	6.94	0.942

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J25	JUNCTION	0.02	0.09	42.33	0 00:25
J24	JUNCTION	0.02	0.11	40.78	0 00:25
J23	JUNCTION	0.03	0.15	39.69	0 00:25
J22	JUNCTION	0.04	0.19	39.49	0 00:25
J21	JUNCTION	0.07	0.30	39.45	0 00:25
J19	JUNCTION	0.04	0.23	39.48	0 00:25
J18	JUNCTION	0.04	0.20	39.55	0 00:25
J17	JUNCTION	0.03	0.13	40.18	0 00:25
J15	JUNCTION	0.02	0.10	41.50	0 00:25
J13	JUNCTION	0.02	0.08	43.23	0 00:25
J12	JUNCTION	0.01	0.07	45.00	0 00:25
J11	JUNCTION	0.01	0.05	46.34	0 00:25
J10	JUNCTION	0.01	0.04	46.88	0 00:25
J16	JUNCTION	0.03	0.13	41.53	0 00:25
J14	JUNCTION	0.01	0.04	43.19	0 00:25
J26	JUNCTION	0.04	0.17	42.41	0 00:25
J27	JUNCTION	0.02	0.08	43.48	0 00:25
J28	JUNCTION	0.01	0.07	44.92	0 00:25
J29	JUNCTION	0.01	0.06	45.79	0 00:25
J173	JUNCTION	0.01	0.04	46.59	0 00:25
Out3	OUTFALL	0.08	0.08	36.73	0 00:14
1	STORAGE	0.92	1.30	37.95	0 00:47

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J25	JUNCTION	4.17	40.72	0 00:25	0.006	0.054
J24	JUNCTION	9.72	50.43	0 00:25	0.013	0.067
J23	JUNCTION	9.72	60.14	0 00:25	0.013	0.080
J22	JUNCTION	14.81	74.93	0 00:25	0.020	0.099
J21	JUNCTION	24.07	172.65	0 00:25	0.032	0.229
J19	JUNCTION	9.26	73.93	0 00:25	0.012	0.098
J18	JUNCTION	9.26	64.74	0 00:25	0.012	0.086
J17	JUNCTION	9.26	55.50	0 00:25	0.012	0.073
J15	JUNCTION	5.79	46.26	0 00:25	0.008	0.061
J13	JUNCTION	5.79	28.93	0 00:25	0.008	0.038
J12	JUNCTION	9.26	23.14	0 00:25	0.012	0.031
J11	JUNCTION	6.94	13.89	0 00:25	0.009	0.018
J10	JUNCTION	6.94	6.94	0 00:25	0.009	0.009
J16	JUNCTION	5.79	11.57	0 00:25	0.008	0.015
J14	JUNCTION	5.79	5.79	0 00:25	0.008	0.008
J26	JUNCTION	4.17	36.56	0 00:25	0.006	0.048
J27	JUNCTION	9.26	32.40	0 00:25	0.012	0.043
J28	JUNCTION	9.26	23.14	0 00:25	0.012	0.031
J29	JUNCTION	6.94	13.89	0 00:25	0.009	0.018
J173	JUNCTION	6.94	6.94	0 00:25	0.009	0.009
Out3	OUTFALL	0.00	15.00	0 00:14	0.000	0.123
1	STORAGE	0.00	172.48	0 00:25	0.000	0.229

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.138	37	0	0.194	52	0 00:47	15.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	96.07	14.84	15.00	0.123
System	96.07	14.84	15.00	0.123

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C57	CONDUIT	15.00	0 00:14	0.67	0.35	0.58
C135	CONDUIT	28.92	0 00:25	1.43	0.08	0.22
C136	CONDUIT	46.25	0 00:25	1.59	0.13	0.28
C137	CONDUIT	55.49	0 00:25	1.17	0.22	0.40
C138	CONDUIT	64.68	0 00:25	0.73	0.23	0.35
C139	CONDUIT	73.77	0 00:25	0.62	0.26	0.44
C140	CONDUIT	74.86	0 00:25	0.70	0.22	0.41
C141	CONDUIT	60.12	0 00:25	0.91	0.14	0.28

C142	CONDUIT	50.42	0	00:25	1.43	0.16	0.32
C143	CONDUIT	40.71	0	00:25	1.68	0.11	0.25
C161	CONDUIT	6.94	0	00:25	0.77	0.03	0.12
C162	CONDUIT	13.88	0	00:25	1.14	0.04	0.15
C163	CONDUIT	23.14	0	00:25	1.48	0.06	0.18
C164	CONDUIT	172.48	0	00:25	1.32	4.29	0.47
C176	CONDUIT	5.79	0	00:25	0.44	0.02	0.20
C177	CONDUIT	11.56	0	00:25	0.40	1.55	0.28
C178	CONDUIT	13.88	0	00:25	1.07	0.05	0.16
C179	CONDUIT	23.14	0	00:25	1.40	0.06	0.19
C180	CONDUIT	32.39	0	00:25	0.96	0.09	0.31
C181	CONDUIT	36.55	0	00:25	1.05	4.89	0.32
C182	CONDUIT	6.94	0	00:25	0.75	0.02	0.13

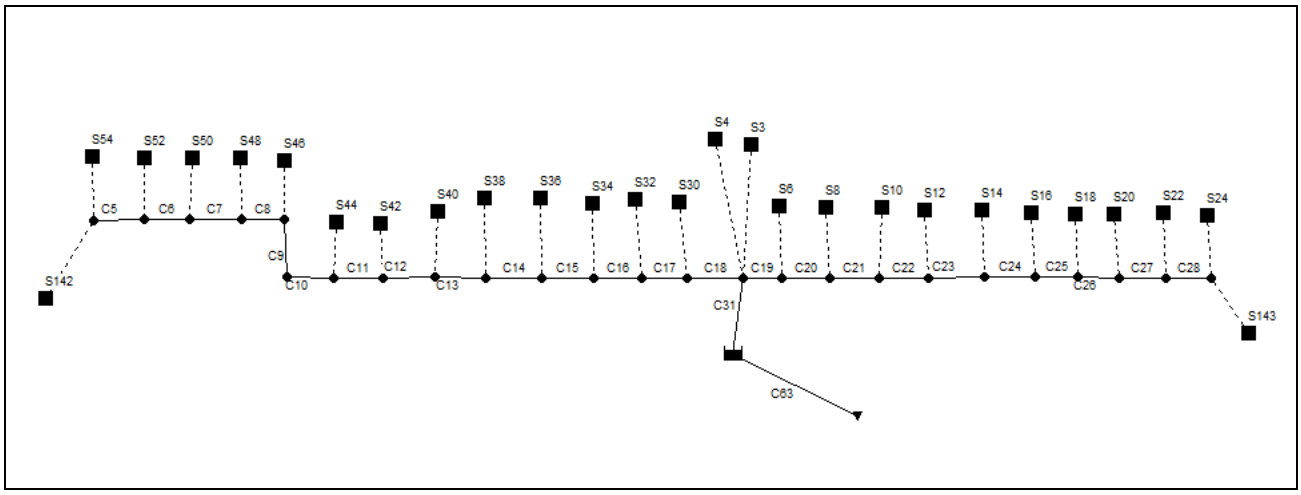
****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
		--- Fraction of Time in Flow Class ----							
C57	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.11	0.0000
C135	1.00	0.03	0.12	0.00	0.54	0.31	0.00	0.65	0.0000
C136	1.00	0.03	0.00	0.00	0.56	0.42	0.00	1.08	0.0000
C137	1.00	0.03	0.00	0.00	0.75	0.22	0.00	0.68	0.0000
C138	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.38	0.0000
C139	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.19	0.0000
C140	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.21	0.0000
C141	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.50	0.0000
C142	1.00	0.03	0.00	0.00	0.60	0.37	0.00	0.97	0.0000
C143	1.00	0.03	0.00	0.00	0.44	0.54	0.00	1.24	0.0000
C161	1.00	0.03	0.00	0.00	0.72	0.25	0.00	0.46	0.0000
C162	1.00	0.03	0.00	0.00	0.66	0.31	0.00	0.65	0.0000
C163	1.00	0.03	0.00	0.00	0.61	0.36	0.00	0.78	0.0000
C164	1.00	0.03	0.00	0.00	0.00	0.00	0.97	0.49	0.0005
C176	1.00	0.03	0.44	0.00	0.53	0.00	0.00	0.11	0.0000
C177	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.20	0.0002
C178	1.00	0.03	0.02	0.00	0.65	0.30	0.00	0.61	0.0000
C179	1.00	0.03	0.00	0.00	0.63	0.35	0.00	0.72	0.0000
C180	1.00	0.03	0.35	0.00	0.55	0.07	0.00	0.26	0.0000
C181	1.00	0.03	0.00	0.00	0.82	0.16	0.00	0.36	0.0006
C182	1.00	0.03	0.00	0.00	0.73	0.24	0.00	0.44	0.0000

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C164	0.01	0.01	0.01	0.53	0.01
C177	0.01	0.01	0.01	0.28	0.01
C181	0.01	0.01	0.01	0.55	0.01

ST05 – TRINCEA DI CORTE TEGGE



- Durata 15' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 03:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.046        43.668
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.003         2.444
Surface Runoff ...........        0.042        39.956
Final Surface Storage ....        0.001         1.270
Continuity Error (%) .....        0.000
**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************    ---------     ---------
Dry Weather Inflow .......        0.000         0.000
Wet Weather Inflow .......        0.042         0.422
Groundwater Inflow .......        0.000         0.000
RDII Inflow ..............        0.000         0.000
External Inflow ..........        0.000         0.000
External Outflow .........        0.031         0.312
Internal Outflow .........        0.000         0.000
Storage Losses ...........        0.000         0.000
Initial Stored Volume ....        0.000         0.000
Final Stored Volume ......        0.011         0.110
```

Continuity Error (%) 0.000
****
Time-Step Critical Elements
****
Link C63 (96.60%)
Link C31 (1.98%)
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 0.51 sec
Maximum Time Step : 1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S38	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S36	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S34	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S32	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S30	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S3	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S6	43.67	0.00	0.00	2.45	39.95	0.02	45.92	0.915
S8	43.67	0.00	0.00	2.45	39.95	0.02	45.92	0.915
S10	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S12	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S44	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S42	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S40	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S4	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S46	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S48	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S50	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S52	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S54	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S14	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S16	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S18	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S20	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S22	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S24	43.67	0.00	0.00	2.45	39.95	0.01	27.75	0.915
S142	43.67	0.00	0.00	2.44	39.96	0.04	92.74	0.915
S143	43.67	0.00	0.00	2.44	39.97	0.07	153.25	0.915

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J138	JUNCTION	0.02	0.31	37.33	0 00:08
J139	JUNCTION	0.02	0.36	36.84	0 00:08
J140	JUNCTION	0.02	0.35	36.45	0 00:08
J141	JUNCTION	0.03	0.44	36.19	0 00:09
J142	JUNCTION	0.04	0.56	36.11	0 00:09
J143	JUNCTION	0.03	0.43	36.18	0 00:09
J144	JUNCTION	0.02	0.34	36.45	0 00:09
J145	JUNCTION	0.02	0.31	36.81	0 00:09
J146	JUNCTION	0.02	0.32	37.36	0 00:09
J147	JUNCTION	0.02	0.29	37.95	0 00:09
J151	JUNCTION	0.02	0.28	38.57	0 00:09
J152	JUNCTION	0.02	0.27	39.15	0 00:09
J153	JUNCTION	0.02	0.26	39.69	0 00:09
J154	JUNCTION	0.02	0.25	40.17	0 00:08

J155	JUNCTION	0.03	0.42	40.34	0	00:08
J156	JUNCTION	0.01	0.23	40.67	0	00:08
J157	JUNCTION	0.01	0.22	41.10	0	00:08
J162	JUNCTION	0.01	0.21	41.50	0	00:08
J163	JUNCTION	0.01	0.19	41.85	0	00:08
J167	JUNCTION	0.02	0.28	37.92	0	00:08
J168	JUNCTION	0.01	0.21	38.48	0	00:08
J169	JUNCTION	0.01	0.26	39.15	0	00:08
J170	JUNCTION	0.01	0.24	39.76	0	00:08
J171	JUNCTION	0.01	0.29	40.43	0	00:08
J172	JUNCTION	0.01	0.26	41.03	0	00:08
Out3	OUTFALL	0.10	0.10	33.10	0	00:07
1	STORAGE	0.56	0.87	33.87	0	00:20

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J138	JUNCTION	27.75	343.71	0 00:08	0.012	0.150
J139	JUNCTION	27.75	370.71	0 00:08	0.012	0.162
J140	JUNCTION	45.91	414.34	0 00:08	0.020	0.182
J141	JUNCTION	45.91	459.15	0 00:08	0.020	0.202
J142	JUNCTION	55.49	935.07	0 00:09	0.024	0.422
J143	JUNCTION	27.75	432.68	0 00:09	0.012	0.196
J144	JUNCTION	27.75	407.61	0 00:09	0.012	0.184
J145	JUNCTION	27.75	382.34	0 00:09	0.012	0.172
J146	JUNCTION	27.75	357.01	0 00:09	0.012	0.160
J147	JUNCTION	27.75	332.04	0 00:09	0.012	0.148
J151	JUNCTION	27.75	306.90	0 00:09	0.012	0.136
J152	JUNCTION	27.75	281.20	0 00:09	0.012	0.124
J153	JUNCTION	27.75	255.28	0 00:08	0.012	0.112
J154	JUNCTION	0.00	228.93	0 00:08	0.000	0.100
J155	JUNCTION	27.75	228.94	0 00:08	0.012	0.100
J156	JUNCTION	27.75	202.44	0 00:08	0.012	0.088
J157	JUNCTION	27.75	175.25	0 00:08	0.012	0.076
J162	JUNCTION	27.75	148.06	0 00:08	0.012	0.064
J163	JUNCTION	120.48	120.48	0 00:08	0.052	0.052
J167	JUNCTION	27.75	317.31	0 00:08	0.012	0.138
J168	JUNCTION	27.75	290.39	0 00:08	0.012	0.126
J169	JUNCTION	27.75	263.21	0 00:08	0.012	0.114
J170	JUNCTION	27.75	235.99	0 00:08	0.012	0.102
J171	JUNCTION	27.75	208.62	0 00:08	0.012	0.090
J172	JUNCTION	181.00	181.00	0 00:08	0.078	0.078
Out3	OUTFALL	0.00	30.00	0 00:07	0.000	0.312
1	STORAGE	0.00	934.15	0 00:09	0.000	0.422

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.251	22	0	0.390	35	0 00:20	30.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	98.52	29.80	30.00	0.312

```
-------------------------------------------------------------
System              98.52     29.80     30.00       0.312
********************
Link Flow Summary
********************
-----------------------------------------------------------------------------
                        Maximum  Time of Max   Maximum    Max/    Max/
                         |Flow|   Occurrence   |Veloc|    Full    Full
Link              Type        LPS  days hr:min    m/sec    Flow   Depth
-----------------------------------------------------------------------------
C63               CONDUIT     30.00     0  00:07      0.78    0.29    0.57
C14               CONDUIT    331.53     0  00:09      2.32    0.47    0.50
C15               CONDUIT    357.17     0  00:09      2.39    0.54    0.52
C16               CONDUIT    382.66     0  00:09      1.99    0.32    0.41
C17               CONDUIT    407.94     0  00:09      1.70    0.35    0.48
C18               CONDUIT    432.70     0  00:09      1.33    0.50    0.62
C19               CONDUIT    457.22     0  00:09      1.39    0.53    0.63
C20               CONDUIT    415.00     0  00:09      1.69    0.36    0.49
C21               CONDUIT    370.00     0  00:08      2.14    0.67    0.59
C22               CONDUIT    344.06     0  00:08      2.12    0.52    0.56
C7               CONDUIT    174.89     0  00:08      1.78    0.30    0.38
C8               CONDUIT    201.80     0  00:08      1.30    0.31    0.54
C9               CONDUIT    228.93     0  00:08      1.42   14.69    0.55
C10               CONDUIT    228.82     0  00:08      2.00    0.37    0.42
C11               CONDUIT    254.87     0  00:09      2.14    0.38    0.44
C12               CONDUIT    280.75     0  00:09      2.26    0.41    0.45
C13               CONDUIT    306.27     0  00:09      2.34    0.43    0.47
C31               CONDUIT    934.15     0  00:09      2.47    0.84    0.70
C5               CONDUIT    120.33     0  00:08      1.46    0.22    0.33
C6               CONDUIT    147.62     0  00:08      1.61    0.26    0.36
C23               CONDUIT    316.86     0  00:08      2.28    0.45    0.49
C24               CONDUIT    290.20     0  00:08      2.68    0.26    0.41
C25               CONDUIT    263.18     0  00:08      2.60    0.37    0.39
C27               CONDUIT    208.37     0  00:08      2.36    0.87    0.66
C28               CONDUIT    180.88     0  00:08      1.96    0.75    0.69
C26               CONDUIT    235.70     0  00:08      2.13    0.33    0.41
****************************
Flow Classification Summary
****************************
-----------------------------------------------------------------------------------------
                Adjusted    --- Fraction of Time in Flow Class ----   Avg.     Avg.
                 /Actual       Up   Down  Sub   Sup   Up    Down   Froude   Flow
Conduit           Length    Dry  Dry   Dry   Crit  Crit  Crit  Crit   Number   Change
-----------------------------------------------------------------------------------------
C63                 1.00   0.01  0.00  0.00  0.99  0.00  0.00  0.00     0.14   0.0000
C14                 1.00   0.01  0.00  0.00  0.77  0.23  0.00  0.00     0.76   0.0000
C15                 1.00   0.01  0.00  0.00  0.75  0.24  0.00  0.00     0.80   0.0001
C16                 1.00   0.01  0.00  0.00  0.86  0.13  0.00  0.00     0.65   0.0000
C17                 1.00   0.01  0.00  0.00  0.92  0.07  0.00  0.00     0.56   0.0000
C18                 1.00   0.01  0.00  0.00  0.99  0.00  0.00  0.00     0.42   0.0000
C19                 1.00   0.01  0.55  0.00  0.44  0.00  0.00  0.00     0.15   0.0001
C20                 1.00   0.01  0.00  0.00  0.94  0.05  0.00  0.00     0.25   0.0000
C21                 1.00   0.01  0.00  0.00  0.89  0.10  0.00  0.00     0.33   0.0001
C22                 1.00   0.01  0.00  0.00  0.88  0.11  0.00  0.00     0.30   0.0000
C7                 1.00   0.01  0.00  0.00  0.90  0.09  0.00  0.00     0.25   0.0000
C8                 1.00   0.01  0.62  0.00  0.36  0.00  0.00  0.00     0.08   0.0000
C9                 1.00   0.01  0.00  0.00  0.99  0.00  0.00  0.00     0.16   0.0014
C10                 1.00   0.01  0.00  0.00  0.82  0.17  0.00  0.00     0.71   0.0000
C11                 1.00   0.01  0.00  0.00  0.80  0.20  0.00  0.00     0.75   0.0000
C12                 1.00   0.01  0.00  0.00  0.77  0.22  0.00  0.00     0.79   0.0000
C13                 1.00   0.01  0.00  0.00  0.76  0.23  0.00  0.00     0.80   0.0000
C31                 1.00   0.01  0.00  0.00  0.00  0.00  0.00  0.99     0.81   0.0001
C5                 1.00   0.01  0.00  0.00  0.93  0.06  0.00  0.00     0.18   0.0000
C6                 1.00   0.01  0.00  0.00  0.92  0.07  0.00  0.00     0.22   0.0000
C23                 1.00   0.01  0.00  0.00  0.85  0.14  0.00  0.00     0.33   0.0000
C24                 1.00   0.01  0.00  0.00  0.81  0.18  0.00  0.00     0.39   0.0000
C25                 1.00   0.01  0.00  0.00  0.82  0.17  0.00  0.00     0.38   0.0000
C27                 1.00   0.01  0.00  0.00  0.85  0.14  0.00  0.00     0.31   0.0001
C28                 1.00   0.01  0.00  0.00  0.91  0.08  0.00  0.00     0.22   0.0001
C26                 1.00   0.01  0.00  0.00  0.88  0.11  0.00  0.00     0.28   0.0000
*************************
Conduit Surcharge Summary
*************************
-----------------------------------------------------------------------------
                                          Hours      Hours
```

```
                 --------- Hours Full --------   Above Full   Capacity
Conduit             Both Ends  Upstream  Dnstream   Normal Flow   Limited
-----------------------------------------------------------------------------
C9                    0.01      0.01      0.01      0.21         0.01
```

- Durata 30' – T_R100anni

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
*************************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*************************************************************
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 03:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************    ---------       -------
Total Precipitation ......        0.059        56.040
Evaporation Loss .........        0.000         0.000
Infiltration Loss ........        0.003         2.465
Surface Runoff ...........        0.055        52.306
Final Surface Storage ....        0.001         1.270
Continuity Error (%) .....        0.000
**************************       Volume       Volume
Flow Routing Continuity        hectare-m     10^6 ltr
**************************    ---------    ---------
Dry Weather Inflow .......        0.000        0.000
Wet Weather Inflow .......        0.055        0.552
Groundwater Inflow .......        0.000        0.000
RDII Inflow ..............        0.000        0.000
External Inflow ..........        0.000        0.000
External Outflow .........        0.030        0.304
Internal Outflow .........        0.000        0.000
Storage Losses ...........        0.000        0.000
Initial Stored Volume ....        0.000        0.000
Final Stored Volume ......        0.025        0.247
Continuity Error (%) .....        0.000
***************************
Time-Step Critical Elements
***************************
Link C63 (96.88%)
*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.51 sec
Maximum Time Step           :     1.00 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 10^6 ltr	Peak Runoff LPS	Runoff Coeff
S38	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S36	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S34	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S32	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S30	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S3	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S6	56.04	0.00	0.00	2.47	52.30	0.03	29.86	0.933
S8	56.04	0.00	0.00	2.47	52.30	0.03	29.86	0.933
S10	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S12	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S44	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S42	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S40	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S4	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S46	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S48	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S50	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S52	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S54	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S14	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S16	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S18	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S20	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S22	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S24	56.04	0.00	0.00	2.47	52.30	0.02	17.94	0.933
S142	56.04	0.00	0.00	2.46	52.31	0.05	59.82	0.933
S143	56.04	0.00	0.00	2.46	52.31	0.09	98.72	0.933

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J138	JUNCTION	0.03	0.24	37.26	0 00:17
J139	JUNCTION	0.03	0.28	36.76	0 00:17
J140	JUNCTION	0.03	0.27	36.37	0 00:17
J141	JUNCTION	0.04	0.33	36.08	0 00:17
J142	JUNCTION	0.05	0.43	35.98	0 00:17
J143	JUNCTION	0.04	0.32	36.07	0 00:17
J144	JUNCTION	0.03	0.27	36.38	0 00:17
J145	JUNCTION	0.03	0.25	36.75	0 00:17
J146	JUNCTION	0.03	0.25	37.29	0 00:17
J147	JUNCTION	0.03	0.23	37.89	0 00:17
J151	JUNCTION	0.03	0.22	38.51	0 00:17
J152	JUNCTION	0.02	0.21	39.09	0 00:17
J153	JUNCTION	0.02	0.21	39.64	0 00:17
J154	JUNCTION	0.02	0.20	40.12	0 00:17
J155	JUNCTION	0.05	0.34	40.26	0 00:17
J156	JUNCTION	0.02	0.18	40.62	0 00:17
J157	JUNCTION	0.02	0.18	41.06	0 00:17
J162	JUNCTION	0.02	0.17	41.46	0 00:17
J163	JUNCTION	0.02	0.15	41.81	0 00:17
J167	JUNCTION	0.02	0.22	37.86	0 00:17
J168	JUNCTION	0.02	0.17	38.44	0 00:17
J169	JUNCTION	0.02	0.21	39.10	0 00:17
J170	JUNCTION	0.02	0.19	39.71	0 00:17
J171	JUNCTION	0.02	0.22	40.36	0 00:17
J172	JUNCTION	0.02	0.20	40.97	0 00:17
Out3	OUTFALL	0.10	0.10	33.10	0 00:11
1	STORAGE	0.80	1.11	34.11	0 00:34

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J138	JUNCTION	17.94	223.99	0 00:17	0.016	0.196
J139	JUNCTION	17.94	241.78	0 00:17	0.016	0.212
J140	JUNCTION	29.85	271.39	0 00:17	0.026	0.238
J141	JUNCTION	29.85	301.00	0 00:17	0.026	0.264
J142	JUNCTION	35.88	622.41	0 00:17	0.031	0.552
J143	JUNCTION	17.94	288.34	0 00:17	0.016	0.256
J144	JUNCTION	17.94	271.17	0 00:17	0.016	0.241
J145	JUNCTION	17.94	253.81	0 00:17	0.016	0.225
J146	JUNCTION	17.94	236.39	0 00:17	0.016	0.209
J147	JUNCTION	17.94	219.09	0 00:17	0.016	0.194
J151	JUNCTION	17.94	201.70	0 00:17	0.016	0.178
J152	JUNCTION	17.94	184.22	0 00:17	0.016	0.162
J153	JUNCTION	17.94	166.63	0 00:17	0.016	0.146
J154	JUNCTION	0.00	149.07	0 00:17	0.000	0.131
J155	JUNCTION	17.94	149.26	0 00:17	0.016	0.131
J156	JUNCTION	17.94	131.43	0 00:17	0.016	0.115
J157	JUNCTION	17.94	113.57	0 00:17	0.016	0.099
J162	JUNCTION	17.94	95.68	0 00:17	0.016	0.084
J163	JUNCTION	77.76	77.76	0 00:17	0.068	0.068
J167	JUNCTION	17.94	206.15	0 00:17	0.016	0.180
J168	JUNCTION	17.94	188.27	0 00:17	0.016	0.165
J169	JUNCTION	17.94	170.38	0 00:17	0.016	0.149
J170	JUNCTION	17.94	152.48	0 00:17	0.016	0.133
J171	JUNCTION	17.94	134.58	0 00:17	0.016	0.118
J172	JUNCTION	116.66	116.66	0 00:17	0.102	0.102
Out3	OUTFALL	0.00	30.00	0 00:11	0.000	0.304
1	STORAGE	0.00	622.23	0 00:17	0.000	0.552

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.359	32	0	0.502	45	0 00:34	30.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	97.59	29.70	30.00	0.304
System	97.59	29.70	30.00	0.304

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C63	CONDUIT	30.00	0 00:11	0.79	0.29	0.57
C14	CONDUIT	218.89	0 00:17	2.08	0.31	0.40
C15	CONDUIT	236.43	0 00:17	2.13	0.36	0.42
C16	CONDUIT	253.86	0 00:17	1.81	0.21	0.32
C17	CONDUIT	271.19	0 00:17	1.61	0.24	0.37
C18	CONDUIT	288.22	0 00:17	1.24	0.34	0.47
C19	CONDUIT	300.84	0 00:17	1.28	0.35	0.48

C20	CONDUIT	271.33	0	00:17	1.57	0.24	0.38
C21	CONDUIT	241.60	0	00:17	1.92	0.44	0.46
C22	CONDUIT	223.87	0	00:17	1.91	0.34	0.43
C7	CONDUIT	113.50	0	00:17	1.58	0.19	0.30
C8	CONDUIT	131.34	0	00:17	1.11	0.20	0.43
C9	CONDUIT	149.07	0	00:17	1.22	9.57	0.45
C10	CONDUIT	148.99	0	00:17	1.78	0.24	0.34
C11	CONDUIT	166.45	0	00:17	1.90	0.25	0.35
C12	CONDUIT	184.00	0	00:17	2.01	0.27	0.36
C13	CONDUIT	201.49	0	00:17	2.09	0.28	0.37
C31	CONDUIT	622.23	0	00:17	2.27	0.56	0.54
C5	CONDUIT	77.74	0	00:17	1.29	0.14	0.27
C6	CONDUIT	95.63	0	00:17	1.43	0.17	0.29
C23	CONDUIT	206.07	0	00:17	2.04	0.29	0.39
C24	CONDUIT	188.22	0	00:17	2.38	0.17	0.32
C25	CONDUIT	170.34	0	00:17	2.29	0.24	0.31
C27	CONDUIT	134.55	0	00:17	2.10	0.56	0.51
C28	CONDUIT	116.64	0	00:17	1.78	0.49	0.52
C26	CONDUIT	152.45	0	00:17	1.88	0.22	0.33

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C63	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.10	0.0000
C14	1.00	0.02	0.00	0.00	0.69	0.30	0.00	0.85	0.0000
C15	1.00	0.02	0.00	0.00	0.67	0.31	0.00	0.89	0.0000
C16	1.00	0.02	0.00	0.00	0.79	0.20	0.00	0.72	0.0000
C17	1.00	0.02	0.00	0.00	0.84	0.14	0.00	0.61	0.0000
C18	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.46	0.0000
C19	1.00	0.02	0.42	0.00	0.56	0.00	0.00	0.22	0.0000
C20	1.00	0.02	0.00	0.00	0.85	0.13	0.00	0.35	0.0000
C21	1.00	0.02	0.00	0.00	0.81	0.17	0.00	0.45	0.0000
C22	1.00	0.02	0.00	0.00	0.80	0.18	0.00	0.43	0.0000
C7	1.00	0.02	0.00	0.00	0.83	0.16	0.00	0.37	0.0000
C8	1.00	0.02	0.50	0.00	0.48	0.00	0.00	0.13	0.0000
C9	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.21	0.0009
C10	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.79	0.0000
C11	1.00	0.02	0.00	0.00	0.72	0.26	0.00	0.84	0.0000
C12	1.00	0.02	0.00	0.00	0.70	0.29	0.00	0.88	0.0000
C13	1.00	0.02	0.00	0.00	0.68	0.30	0.00	0.90	0.0000
C31	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.89	0.0001
C5	1.00	0.02	0.00	0.00	0.86	0.13	0.00	0.29	0.0000
C6	1.00	0.02	0.00	0.00	0.85	0.14	0.00	0.33	0.0000
C23	1.00	0.02	0.00	0.00	0.77	0.21	0.00	0.47	0.0000
C24	1.00	0.02	0.00	0.00	0.73	0.25	0.00	0.57	0.0000
C25	1.00	0.02	0.00	0.00	0.74	0.25	0.00	0.55	0.0000
C27	1.00	0.02	0.00	0.00	0.76	0.22	0.00	0.47	0.0001
C28	1.00	0.02	0.00	0.00	0.84	0.15	0.00	0.35	0.0000
C26	1.00	0.02	0.00	0.00	0.80	0.18	0.00	0.42	0.0000

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Hours Above Full Dnstream	Hours Capacity Limited Normal Flow
C9	0.01	0.01	0.01	0.40	0.01

- <u>Durata 45' – T_R100anni</u>

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

```
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ FEB-14-2012 00:00:00
Ending Date .............. FEB-14-2012 03:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:00:30
Wet Time Step ............ 00:00:05
Dry Time Step ............ 00:00:30
Routing Time Step ........ 1.00 sec
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m           mm
**************************     ---------       -------
Total Precipitation ......         0.069        64.940
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.003         2.477
Surface Runoff ...........         0.065        61.194
Final Surface Storage ....         0.001         1.270
Continuity Error (%) .....         0.000
**************************        Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.065         0.646
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.030         0.298
Internal Outflow .........         0.000         0.000
Storage Losses ...........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.035         0.348
Continuity Error (%) .....         0.007
**************************
Time-Step Critical Elements
**************************
Link C63 (95.93%)
********************************
Highest Flow Instability Indexes
********************************
All links are stable.
************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.52 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
**************************
Subcatchment Runoff Summary
**************************
-------------------------------------------------------------------------------------------------
                    Total     Total     Total     Total     Total     Total     Peak  Runoff
                   Precip     Runon      Evap      Infil    Runoff    Runoff   Runoff   Coeff
Subcatchment           mm        mm        mm        mm        mm    10^6 ltr      LPS
-------------------------------------------------------------------------------------------------
S38                  64.94      0.00      0.00      2.48     61.19      0.02    13.89   0.942
S36                  64.94      0.00      0.00      2.48     61.19      0.02    13.89   0.942
S34                  64.94      0.00      0.00      2.48     61.19      0.02    13.89   0.942
S32                  64.94      0.00      0.00      2.48     61.19      0.02    13.89   0.942
S30                  64.94      0.00      0.00      2.48     61.19      0.02    13.89   0.942
S3                   64.94      0.00      0.00      2.48     61.19      0.02    13.89   0.942
S6                   64.94      0.00      0.00      2.48     61.19      0.03    23.13   0.942
S8                   64.94      0.00      0.00      2.48     61.19      0.03    23.13   0.942
```

S10	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S12	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S44	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S42	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S40	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S4	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S46	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S48	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S50	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S52	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S54	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S14	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S16	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S18	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S20	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S22	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S24	64.94	0.00	0.00	2.48	61.19	0.02	13.89	0.942
S142	64.94	0.00	0.00	2.48	61.20	0.06	46.29	0.942
S143	64.94	0.00	0.00	2.47	61.20	0.10	76.39	0.942

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J138	JUNCTION	0.03	0.21	37.23	0 00:25
J139	JUNCTION	0.04	0.24	36.72	0 00:25
J140	JUNCTION	0.04	0.23	36.33	0 00:25
J141	JUNCTION	0.05	0.29	36.04	0 00:25
J142	JUNCTION	0.06	0.37	35.92	0 00:25
J143	JUNCTION	0.05	0.28	36.03	0 00:25
J144	JUNCTION	0.04	0.23	36.34	0 00:25
J145	JUNCTION	0.04	0.22	36.72	0 00:25
J146	JUNCTION	0.04	0.22	37.26	0 00:25
J147	JUNCTION	0.04	0.20	37.86	0 00:25
J151	JUNCTION	0.03	0.19	38.48	0 00:25
J152	JUNCTION	0.03	0.19	39.07	0 00:25
J153	JUNCTION	0.03	0.18	39.61	0 00:25
J154	JUNCTION	0.03	0.17	40.09	0 00:25
J155	JUNCTION	0.06	0.30	40.22	0 00:25
J156	JUNCTION	0.03	0.16	40.60	0 00:25
J157	JUNCTION	0.03	0.16	41.04	0 00:25
J162	JUNCTION	0.02	0.15	41.44	0 00:25
J163	JUNCTION	0.02	0.13	41.79	0 00:25
J167	JUNCTION	0.03	0.19	37.83	0 00:25
J168	JUNCTION	0.02	0.15	38.42	0 00:25
J169	JUNCTION	0.03	0.18	39.07	0 00:25
J170	JUNCTION	0.03	0.17	39.69	0 00:25
J171	JUNCTION	0.03	0.19	40.33	0 00:25
J172	JUNCTION	0.03	0.17	40.94	0 00:25
Out3	OUTFALL	0.10	0.10	33.10	0 00:15
1	STORAGE	0.94	1.28	34.28	0 00:49

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J138	JUNCTION	13.89	173.51	0 00:25	0.018	0.229
J139	JUNCTION	13.89	187.37	0 00:25	0.018	0.248
J140	JUNCTION	23.13	210.47	0 00:25	0.031	0.278
J141	JUNCTION	23.13	233.56	0 00:25	0.031	0.309
J142	JUNCTION	27.77	486.45	0 00:25	0.037	0.646
J143	JUNCTION	13.89	225.68	0 00:25	0.018	0.300
J144	JUNCTION	13.89	212.07	0 00:25	0.018	0.281
J145	JUNCTION	13.89	198.40	0 00:25	0.018	0.263
J146	JUNCTION	13.89	184.68	0 00:25	0.018	0.245
J147	JUNCTION	13.89	170.91	0 00:25	0.018	0.226
J151	JUNCTION	13.89	157.12	0 00:25	0.018	0.208
J152	JUNCTION	13.89	143.30	0 00:25	0.018	0.190

J153	JUNCTION	13.89	129.47	0	00:25	0.018	0.171
J154	JUNCTION	0.00	115.63	0	00:25	0.000	0.153
J155	JUNCTION	13.89	115.67	0	00:25	0.018	0.153
J156	JUNCTION	13.89	101.80	0	00:25	0.018	0.135
J157	JUNCTION	13.89	87.93	0	00:25	0.018	0.116
J162	JUNCTION	13.89	74.06	0	00:25	0.018	0.098
J163	JUNCTION	60.18	60.18	0	00:25	0.080	0.080
J167	JUNCTION	13.89	159.64	0	00:25	0.018	0.211
J168	JUNCTION	13.89	145.77	0	00:25	0.018	0.193
J169	JUNCTION	13.89	131.90	0	00:25	0.018	0.174
J170	JUNCTION	13.89	118.03	0	00:25	0.018	0.156
J171	JUNCTION	13.89	104.15	0	00:25	0.018	0.138
J172	JUNCTION	90.27	90.27	0	00:25	0.119	0.119
Out3	OUTFALL	0.00	30.00	0	00:15	0.000	0.298
1	STORAGE	0.00	486.24	0	00:25	0.000	0.646

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
1	0.425	38	0	0.575	51	0 00:49	30.00

****
Outfall Loading Summary
****

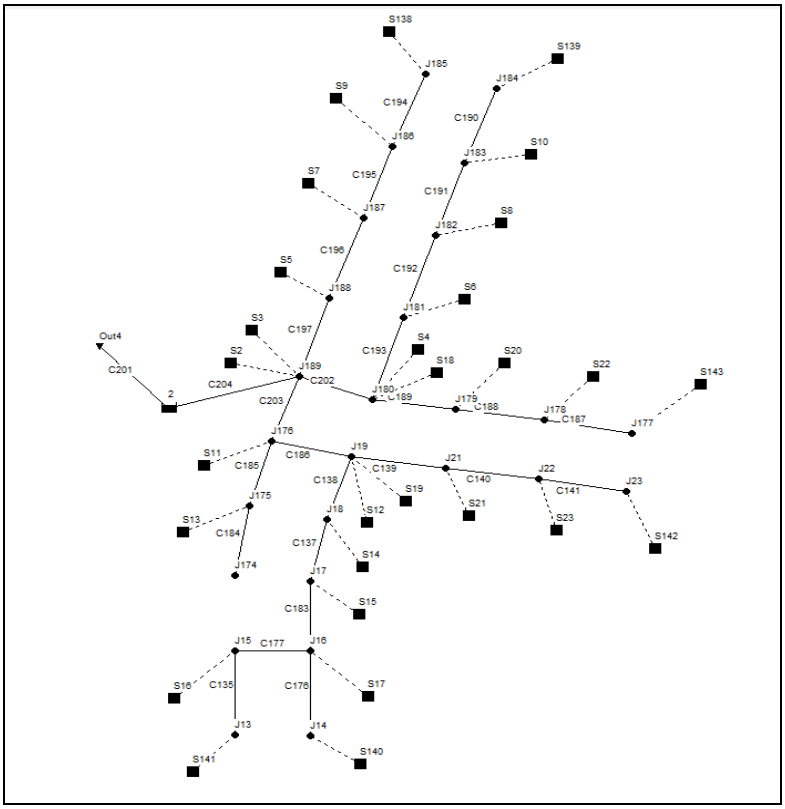
Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out3	96.74	29.61	30.00	0.298
System	96.74	29.61	30.00	0.298

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C63	CONDUIT	30.00	0 00:15	0.79	0.29	0.57
C14	CONDUIT	170.82	0 00:25	1.94	0.24	0.35
C15	CONDUIT	184.56	0 00:25	1.98	0.28	0.36
C16	CONDUIT	198.26	0 00:25	1.70	0.17	0.28
C17	CONDUIT	212.01	0 00:25	1.53	0.18	0.32
C18	CONDUIT	225.48	0 00:25	1.18	0.26	0.41
C19	CONDUIT	233.53	0 00:25	1.20	0.27	0.41
C20	CONDUIT	210.44	0 00:25	1.49	0.19	0.32
C21	CONDUIT	187.35	0 00:25	1.80	0.34	0.40
C22	CONDUIT	173.49	0 00:25	1.78	0.26	0.38
C7	CONDUIT	87.92	0 00:25	1.47	0.15	0.26
C8	CONDUIT	101.79	0 00:25	1.01	0.16	0.39
C9	CONDUIT	115.63	0 00:25	1.10	7.42	0.40
C10	CONDUIT	115.61	0 00:25	1.65	0.19	0.30
C11	CONDUIT	129.42	0 00:25	1.77	0.20	0.30
C12	CONDUIT	143.24	0 00:25	1.88	0.21	0.32
C13	CONDUIT	157.04	0 00:25	1.95	0.22	0.33
C31	CONDUIT	486.24	0 00:25	2.13	0.44	0.46
C5	CONDUIT	60.17	0 00:25	1.20	0.11	0.23
C6	CONDUIT	74.05	0 00:25	1.33	0.13	0.25
C23	CONDUIT	159.63	0 00:25	1.90	0.23	0.34
C24	CONDUIT	145.76	0 00:25	2.21	0.13	0.28
C25	CONDUIT	131.89	0 00:25	2.13	0.19	0.27
C27	CONDUIT	104.14	0 00:25	1.95	0.44	0.44

```
C28              CONDUIT     90.27     0  00:25      1.66    0.38    0.45
C26              CONDUIT    118.02     0  00:25      1.75    0.17    0.29
***************************
Flow Classification Summary
***************************
-----------------------------------------------------------------------------------------
                 Adjusted    --- Fraction of Time in Flow Class ----   Avg.     Avg.
                  /Actual        Up   Down  Sub   Sup   Up    Down   Froude   Flow
Conduit            Length     Dry  Dry   Dry   Crit  Crit  Crit  Crit   Number   Change
-----------------------------------------------------------------------------------------
C63                 1.00   0.03  0.00  0.00  0.97  0.00  0.00  0.00     0.10   0.0000
C14                 1.00   0.02  0.00  0.00  0.61  0.37  0.00  0.00     0.93   0.0000
C15                 1.00   0.02  0.00  0.00  0.59  0.39  0.00  0.00     0.96   0.0000
C16                 1.00   0.02  0.00  0.00  0.71  0.27  0.00  0.00     0.78   0.0000
C17                 1.00   0.02  0.00  0.00  0.76  0.21  0.00  0.00     0.66   0.0000
C18                 1.00   0.02  0.00  0.00  0.98  0.00  0.00  0.00     0.49   0.0000
C19                 1.00   0.02  0.26  0.00  0.72  0.00  0.00  0.00     0.29   0.0000
C20                 1.00   0.02  0.00  0.00  0.78  0.20  0.00  0.00     0.45   0.0000
C21                 1.00   0.02  0.00  0.00  0.73  0.25  0.00  0.00     0.58   0.0000
C22                 1.00   0.02  0.00  0.00  0.73  0.25  0.00  0.00     0.56   0.0000
C7                  1.00   0.02  0.00  0.00  0.75  0.23  0.00  0.00     0.49   0.0000
C8                  1.00   0.02  0.39  0.00  0.59  0.00  0.00  0.00     0.18   0.0000
C9                  1.00   0.02  0.00  0.00  0.98  0.00  0.00  0.00     0.26   0.0007
C10                 1.00   0.02  0.00  0.00  0.67  0.31  0.00  0.00     0.85   0.0000
C11                 1.00   0.02  0.00  0.00  0.64  0.34  0.00  0.00     0.91   0.0000
C12                 1.00   0.02  0.00  0.00  0.62  0.36  0.00  0.00     0.95   0.0000
C13                 1.00   0.02  0.00  0.00  0.60  0.38  0.00  0.00     0.97   0.0000
C31                 1.00   0.02  0.00  0.00  0.00  0.00  0.00  0.98     0.96   0.0000
C5                  1.00   0.02  0.00  0.00  0.78  0.20  0.00  0.00     0.39   0.0000
C6                  1.00   0.02  0.03  0.00  0.74  0.21  0.00  0.00     0.45   0.0000
C23                 1.00   0.02  0.00  0.00  0.69  0.29  0.00  0.00     0.62   0.0000
C24                 1.00   0.02  0.00  0.00  0.64  0.34  0.00  0.00     0.76   0.0000
C25                 1.00   0.02  0.00  0.00  0.66  0.32  0.00  0.00     0.73   0.0000
C27                 1.00   0.02  0.00  0.00  0.68  0.30  0.00  0.00     0.63   0.0000
C28                 1.00   0.02  0.00  0.00  0.76  0.22  0.00  0.00     0.48   0.0000
C26                 1.00   0.02  0.00  0.00  0.73  0.25  0.00  0.00     0.56   0.0000
*************************
Conduit Surcharge Summary
*************************
-------------------------------------------------------------------------------
                                                Hours       Hours
                 --------- Hours Full --------   Above Full   Capacity
Conduit            Both Ends  Upstream  Dnstream   Normal Flow   Limited
-------------------------------------------------------------------------------
C9                    0.01      0.01      0.01      0.59         0.01
```

ST06 – SOTTOPASSO DI VIA FERRARONI



- <u>Durata 15' – T_R100anni</u>

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 02:30:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec
********** Volume Depth
Runoff Quantity Continuity hectare-m mm
********** --------- -------
Total Precipitation 0.011 46.400
Evaporation Loss 0.000 0.000
Infiltration Loss 0.001 2.447
Surface Runoff 0.010 42.774

```
Final Surface Storage ....        0.000        1.270
Continuity Error (%) .....       -0.197
**************************       Volume       Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------    ---------
Dry Weather Inflow .......        0.000        0.000
Wet Weather Inflow .......        0.010        0.100
Groundwater Inflow .......        0.000        0.000
RDII Inflow ..............        0.000        0.000
External Inflow ..........        0.000        0.000
External Outflow .........        0.009        0.086
Internal Outflow .........        0.000        0.000
Storage Losses ...........        0.000        0.000
Initial Stored Volume ....        0.000        0.000
Final Stored Volume ......        0.001        0.014
Continuity Error (%) .....       -0.079
***************************
Time-Step Critical Elements
***************************
None
*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
*************************
Routing Time Step Summary
*************************
Minimum Time Step          :     1.00 sec
Average Time Step          :     1.00 sec
Maximum Time Step          :     1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S16	46.40	0.00	0.00	2.44	42.80	0.00	9.81	0.922
S15	46.40	0.00	0.00	2.44	42.79	0.01	18.39	0.922
S14	46.40	0.00	0.00	2.44	42.80	0.00	7.97	0.922
S12	46.40	0.00	0.00	2.44	42.81	0.00	5.62	0.923
S21	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S23	46.40	0.00	0.00	2.44	42.81	0.00	4.29	0.923
S17	46.40	0.00	0.00	2.44	42.80	0.00	9.81	0.922
S19	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S13	46.40	0.00	0.00	2.44	42.80	0.00	7.97	0.922
S11	46.40	0.00	0.00	2.44	42.81	0.00	5.62	0.923
S22	46.40	0.00	0.00	2.44	42.81	0.00	4.29	0.923
S20	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S18	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S4	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S6	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S8	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S10	46.40	0.00	0.00	2.44	42.80	0.00	9.20	0.922
S9	46.40	0.00	0.00	2.44	42.80	0.00	9.20	0.922
S7	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S5	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S3	46.40	0.00	0.00	2.44	42.81	0.00	6.13	0.923
S2	46.40	0.00	0.00	2.44	42.79	0.00	7.36	0.922
S138	46.40	0.00	0.00	2.46	42.72	0.01	13.14	0.921
S139	46.40	0.00	0.00	2.46	42.72	0.01	13.14	0.921
S140	46.40	0.00	0.00	2.46	42.72	0.01	12.15	0.921
S141	46.40	0.00	0.00	2.46	42.72	0.01	12.15	0.921
S142	46.40	0.00	0.00	2.46	42.72	0.01	13.14	0.921
S143	46.40	0.00	0.00	2.46	42.72	0.01	13.14	0.921

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

J23	JUNCTION	0.00	0.06	41.46	0	00:08
J22	JUNCTION	0.01	0.07	40.77	0	00:08
J21	JUNCTION	0.01	0.08	39.98	0	00:08
J19	JUNCTION	0.03	0.23	39.33	0	00:09
J18	JUNCTION	0.02	0.27	39.43	0	00:09
J17	JUNCTION	0.01	0.13	40.15	0	00:08
J15	JUNCTION	0.02	0.16	41.86	0	00:08
J13	JUNCTION	0.00	0.06	42.61	0	00:08
J16	JUNCTION	0.01	0.10	41.80	0	00:08
J14	JUNCTION	0.00	0.06	42.61	0	00:08
J174	JUNCTION	0.00	0.00	40.02	0	00:00
J175	JUNCTION	0.01	0.09	39.25	0	00:08
J176	JUNCTION	0.01	0.12	39.22	0	00:09
J177	JUNCTION	0.00	0.06	41.46	0	00:08
J178	JUNCTION	0.01	0.07	40.77	0	00:08
J179	JUNCTION	0.00	0.07	39.97	0	00:08
J180	JUNCTION	0.05	0.39	38.43	0	00:09
J181	JUNCTION	0.01	0.12	38.46	0	00:09
J182	JUNCTION	0.01	0.09	39.10	0	00:08
J183	JUNCTION	0.01	0.07	40.13	0	00:08
J184	JUNCTION	0.00	0.06	41.47	0	00:08
J185	JUNCTION	0.00	0.07	41.48	0	00:08
J186	JUNCTION	0.00	0.07	40.67	0	00:08
J187	JUNCTION	0.01	0.09	39.10	0	00:08
J188	JUNCTION	0.01	0.11	38.45	0	00:08
J189	JUNCTION	0.05	0.39	38.43	0	00:09
Out4	OUTFALL	0.07	0.07	35.61	0	00:07
2	STORAGE	0.50	0.87	36.41	0	00:20

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J23	JUNCTION	13.14	13.14	0 00:08	0.006	0.006
J22	JUNCTION	4.29	17.35	0 00:08	0.002	0.007
J21	JUNCTION	6.13	23.14	0 00:08	0.003	0.010
J19	JUNCTION	11.75	96.18	0 00:09	0.005	0.044
J18	JUNCTION	7.97	65.67	0 00:08	0.003	0.029
J17	JUNCTION	18.39	59.32	0 00:08	0.008	0.026
J15	JUNCTION	9.81	21.73	0 00:08	0.004	0.009
J13	JUNCTION	12.15	12.15	0 00:08	0.005	0.005
J16	JUNCTION	9.81	42.28	0 00:08	0.004	0.018
J14	JUNCTION	12.15	12.15	0 00:08	0.005	0.005
J174	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J175	JUNCTION	7.97	7.97	0 00:08	0.003	0.003
J176	JUNCTION	5.62	108.03	0 00:09	0.002	0.050
J177	JUNCTION	13.14	13.14	0 00:08	0.006	0.006
J178	JUNCTION	4.29	17.35	0 00:08	0.002	0.007
J179	JUNCTION	6.13	23.17	0 00:08	0.003	0.010
J180	JUNCTION	12.27	66.63	0 00:08	0.005	0.030
J181	JUNCTION	6.13	33.20	0 00:08	0.003	0.015
J182	JUNCTION	6.13	27.86	0 00:08	0.003	0.012
J183	JUNCTION	9.20	22.19	0 00:08	0.004	0.009
J184	JUNCTION	13.14	13.14	0 00:08	0.006	0.006
J185	JUNCTION	13.14	13.14	0 00:08	0.006	0.006
J186	JUNCTION	9.20	22.14	0 00:08	0.004	0.009
J187	JUNCTION	6.13	27.88	0 00:08	0.003	0.012
J188	JUNCTION	6.13	33.25	0 00:08	0.003	0.015
J189	JUNCTION	13.49	215.17	0 00:09	0.006	0.100
Out4	OUTFALL	0.00	10.00	0 00:07	0.000	0.086
2	STORAGE	0.00	214.49	0 00:09	0.000	0.100

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****

Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
2	0.050	20	0	0.087	35	0 00:20	10.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out4	96.04	9.91	10.00	0.086
System	96.04	9.91	10.00	0.086

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C135	CONDUIT	11.93	0 00:08	0.41	0.05	0.28
C137	CONDUIT	57.84	0 00:08	0.92	0.23	0.51
C138	CONDUIT	63.83	0 00:09	0.77	0.90	0.62
C139	CONDUIT	22.53	0 00:08	0.51	0.09	0.38
C140	CONDUIT	17.03	0 00:08	1.02	0.07	0.19
C141	CONDUIT	13.06	0 00:08	0.98	0.05	0.16
C176	CONDUIT	11.94	0 00:08	0.67	0.05	0.20
C177	CONDUIT	20.61	0 00:08	0.59	2.76	0.32
C183	CONDUIT	41.05	0 00:08	1.39	0.13	0.29
C184	CONDUIT	0.00	0 00:00	0.00	0.00	0.11
C185	CONDUIT	7.27	0 00:08	0.29	0.10	0.26
C186	CONDUIT	95.97	0 00:09	1.41	3.37	0.29
C187	CONDUIT	13.06	0 00:08	0.97	0.05	0.16
C188	CONDUIT	17.07	0 00:08	1.18	0.07	0.17
C189	CONDUIT	22.74	0 00:08	0.49	0.06	0.57
C190	CONDUIT	13.00	0 00:08	0.95	0.05	0.17
C191	CONDUIT	21.75	0 00:08	1.13	0.08	0.21
C192	CONDUIT	27.13	0 00:08	0.98	0.12	0.27
C193	CONDUIT	31.89	0 00:09	0.39	0.21	0.64
C194	CONDUIT	12.95	0 00:08	0.94	0.06	0.17
C195	CONDUIT	21.77	0 00:08	1.20	0.06	0.20
C196	CONDUIT	27.19	0 00:08	1.09	0.12	0.25
C197	CONDUIT	31.97	0 00:08	0.34	0.07	0.41
C201	CONDUIT	10.00	0 00:07	0.44	1.34	0.59
C202	CONDUIT	63.80	0 00:09	0.33	2.24	0.65
C203	CONDUIT	107.97	0 00:09	0.95	0.09	0.42
C204	CONDUIT	214.49	0 00:09	1.28	9.73	0.57

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C135	1.00	0.02	0.52	0.00	0.45	0.00	0.00	0.06	0.0000
C137	1.00	0.02	0.00	0.00	0.97	0.01	0.00	0.36	0.0001
C138	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.15	0.0002
C139	1.00	0.02	0.49	0.00	0.49	0.00	0.00	0.06	0.0000
C140	1.00	0.02	0.00	0.00	0.88	0.10	0.00	0.29	0.0000
C141	1.00	0.02	0.00	0.00	0.88	0.10	0.00	0.29	0.0000
C176	1.00	0.02	0.24	0.00	0.73	0.01	0.00	0.15	0.0000
C177	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.17	0.0006
C183	1.00	0.02	0.00	0.00	0.75	0.23	0.00	0.85	0.0000
C184	1.00	0.04	0.96	0.00	0.00	0.00	0.00	0.00	0.0000
C185	1.00	0.02	0.02	0.00	0.96	0.00	0.00	0.09	0.0000
C186	1.00	0.02	0.00	0.00	0.91	0.07	0.00	0.30	0.0007
C187	1.00	0.02	0.00	0.00	0.88	0.10	0.00	0.29	0.0000

C188	1.00	0.02	0.00	0.00	0.83	0.15	0.00	0.00	0.36	0.0000
C189	1.00	0.02	0.54	0.00	0.44	0.00	0.00	0.00	0.03	0.0000
C190	1.00	0.02	0.00	0.00	0.87	0.11	0.00	0.00	0.29	0.0000
C191	1.00	0.02	0.00	0.00	0.87	0.11	0.00	0.00	0.31	0.0000
C192	1.00	0.02	0.02	0.00	0.89	0.07	0.00	0.00	0.24	0.0000
C193	1.00	0.02	0.30	0.00	0.68	0.00	0.00	0.00	0.04	0.0000
C194	1.00	0.02	0.00	0.00	0.86	0.12	0.00	0.00	0.30	0.0000
C195	1.00	0.02	0.00	0.00	0.84	0.14	0.00	0.00	0.33	0.0000
C196	1.00	0.02	0.00	0.00	0.89	0.09	0.00	0.00	0.29	0.0000
C197	1.00	0.02	0.45	0.00	0.53	0.00	0.00	0.00	0.03	0.0000
C201	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.13	0.0001
C202	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.05	0.0005
C203	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.16	0.0000
C204	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.32	0.0022

****
Conduit Surcharge Summary
****

Conduit	Hours Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C177	0.01	0.01	0.01	0.14	0.01
C186	0.01	0.01	0.01	0.16	0.01
C201	0.01	0.01	0.01	2.37	0.01
C202	0.01	0.01	0.01	0.13	0.01
C204	0.01	0.01	0.01	0.22	0.01

- Durata 30' – T_R100anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 02:30:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.014	58.590
Evaporation Loss	0.000	0.000
Infiltration Loss	0.001	2.467
Surface Runoff	0.013	54.854
Final Surface Storage	0.000	1.270
Continuity Error (%)	0.000	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.013	0.128
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000

External Inflow 0.000 0.000
External Outflow 0.008 0.083
Internal Outflow 0.000 0.000
Storage Losses 0.000 0.000
Initial Stored Volume 0.000 0.000
Final Stored Volume 0.005 0.045
Continuity Error (%) 0.000
****

Time-Step Critical Elements
****

None
****

Highest Flow Instability Indexes
****

All links are stable.
****

Routing Time Step Summary
****

Minimum Time Step : 1.00 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S16	58.59	0.00	0.00	2.46	54.86	0.01	6.01	0.936
S15	58.59	0.00	0.00	2.47	54.86	0.01	11.27	0.936
S14	58.59	0.00	0.00	2.46	54.86	0.00	4.88	0.936
S12	58.59	0.00	0.00	2.46	54.86	0.00	3.44	0.936
S21	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S23	58.59	0.00	0.00	2.46	54.86	0.00	2.63	0.936
S17	58.59	0.00	0.00	2.46	54.86	0.01	6.01	0.936
S19	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S13	58.59	0.00	0.00	2.46	54.86	0.00	4.88	0.936
S11	58.59	0.00	0.00	2.46	54.86	0.00	3.44	0.936
S22	58.59	0.00	0.00	2.46	54.86	0.00	2.63	0.936
S20	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S18	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S4	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S6	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S8	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S10	58.59	0.00	0.00	2.46	54.86	0.00	5.63	0.936
S9	58.59	0.00	0.00	2.46	54.86	0.00	5.63	0.936
S7	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S5	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S3	58.59	0.00	0.00	2.46	54.86	0.00	3.76	0.936
S2	58.59	0.00	0.00	2.47	54.86	0.00	4.51	0.936
S138	58.59	0.00	0.00	2.47	54.85	0.01	8.13	0.936
S139	58.59	0.00	0.00	2.47	54.85	0.01	8.13	0.936
S140	58.59	0.00	0.00	2.47	54.85	0.01	7.50	0.936
S141	58.59	0.00	0.00	2.47	54.85	0.01	7.50	0.936
S142	58.59	0.00	0.00	2.47	54.85	0.01	8.13	0.936
S143	58.59	0.00	0.00	2.47	54.85	0.01	8.13	0.936

****

Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J23	JUNCTION	0.01	0.05	41.45	0 00:17
J22	JUNCTION	0.01	0.06	40.76	0 00:17
J21	JUNCTION	0.01	0.07	39.97	0 00:17
J19	JUNCTION	0.04	0.19	39.29	0 00:17
J18	JUNCTION	0.03	0.22	39.38	0 00:17
J17	JUNCTION	0.02	0.11	40.13	0 00:17
J15	JUNCTION	0.02	0.13	41.83	0 00:17
J13	JUNCTION	0.01	0.05	42.60	0 00:17

J16	JUNCTION	0.01	0.08	41.78	0	00:17
J14	JUNCTION	0.01	0.05	42.60	0	00:17
J174	JUNCTION	0.00	0.00	40.02	0	00:00
J175	JUNCTION	0.01	0.07	39.23	0	00:17
J176	JUNCTION	0.02	0.10	39.20	0	00:17
J177	JUNCTION	0.01	0.05	41.45	0	00:17
J178	JUNCTION	0.01	0.06	40.76	0	00:17
J179	JUNCTION	0.01	0.05	39.95	0	00:17
J180	JUNCTION	0.06	0.32	38.36	0	00:17
J181	JUNCTION	0.01	0.10	38.44	0	00:17
J182	JUNCTION	0.01	0.08	39.09	0	00:17
J183	JUNCTION	0.01	0.06	40.12	0	00:17
J184	JUNCTION	0.01	0.05	41.46	0	00:17
J185	JUNCTION	0.01	0.05	41.46	0	00:17
J186	JUNCTION	0.01	0.05	40.65	0	00:17
J187	JUNCTION	0.01	0.08	39.09	0	00:17
J188	JUNCTION	0.01	0.09	38.43	0	00:17
J189	JUNCTION	0.06	0.32	38.36	0	00:17
Out4	OUTFALL	0.06	0.07	35.61	0	00:12
2	STORAGE	0.71	1.09	36.63	0	00:34

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J23	JUNCTION	8.13	8.13	0 00:16	0.007	0.007
J22	JUNCTION	2.63	10.75	0 00:16	0.002	0.009
J21	JUNCTION	3.76	14.48	0 00:16	0.003	0.013
J19	JUNCTION	7.20	63.61	0 00:17	0.006	0.057
J18	JUNCTION	4.88	42.65	0 00:17	0.004	0.038
J17	JUNCTION	11.27	37.96	0 00:16	0.010	0.034
J15	JUNCTION	6.01	13.49	0 00:16	0.005	0.012
J13	JUNCTION	7.50	7.50	0 00:16	0.007	0.007
J16	JUNCTION	6.01	26.85	0 00:16	0.005	0.024
J14	JUNCTION	7.50	7.50	0 00:16	0.007	0.007
J174	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J175	JUNCTION	4.88	4.88	0 00:16	0.004	0.004
J176	JUNCTION	3.44	71.51	0 00:17	0.003	0.064
J177	JUNCTION	8.13	8.13	0 00:16	0.007	0.007
J178	JUNCTION	2.63	10.75	0 00:16	0.002	0.009
J179	JUNCTION	3.76	14.48	0 00:16	0.003	0.013
J180	JUNCTION	7.51	42.93	0 00:16	0.007	0.038
J181	JUNCTION	3.76	21.16	0 00:16	0.003	0.019
J182	JUNCTION	3.76	17.47	0 00:16	0.003	0.015
J183	JUNCTION	5.63	13.75	0 00:16	0.005	0.012
J184	JUNCTION	8.13	8.13	0 00:16	0.007	0.007
J185	JUNCTION	8.13	8.13	0 00:16	0.007	0.007
J186	JUNCTION	5.63	13.75	0 00:16	0.005	0.012
J187	JUNCTION	3.76	17.47	0 00:16	0.003	0.015
J188	JUNCTION	3.76	21.16	0 00:16	0.003	0.019
J189	JUNCTION	8.26	142.29	0 00:17	0.007	0.128
Out4	OUTFALL	0.00	10.00	0 00:12	0.000	0.083
2	STORAGE	0.00	142.03	0 00:17	0.000	0.128

****
Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
2	0.071	28	0	0.109	44	0 00:34	10.00

****

Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out4	93.60	9.85	10.00	0.083
System	93.60	9.85	10.00	0.083

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C135	CONDUIT	7.49	0 00:17	0.34	0.03	0.23
C137	CONDUIT	37.80	0 00:17	0.79	0.15	0.40
C138	CONDUIT	42.26	0 00:17	0.65	0.60	0.51
C139	CONDUIT	14.43	0 00:17	0.41	0.06	0.32
C140	CONDUIT	10.73	0 00:17	0.88	0.04	0.15
C141	CONDUIT	8.12	0 00:17	0.84	0.03	0.13
C176	CONDUIT	7.49	0 00:17	0.57	0.03	0.16
C177	CONDUIT	13.37	0 00:17	0.50	1.79	0.27
C183	CONDUIT	26.72	0 00:17	1.22	0.08	0.23
C184	CONDUIT	0.00	0 00:00	0.00	0.00	0.09
C185	CONDUIT	4.79	0 00:17	0.25	0.07	0.21
C186	CONDUIT	63.47	0 00:17	1.20	2.23	0.24
C187	CONDUIT	8.12	0 00:17	0.84	0.03	0.13
C188	CONDUIT	10.73	0 00:17	1.02	0.04	0.14
C189	CONDUIT	14.45	0 00:17	0.38	0.04	0.47
C190	CONDUIT	8.12	0 00:17	0.82	0.03	0.13
C191	CONDUIT	13.72	0 00:17	0.98	0.05	0.17
C192	CONDUIT	17.41	0 00:17	0.85	0.08	0.22
C193	CONDUIT	21.01	0 00:17	0.32	0.14	0.52
C194	CONDUIT	8.11	0 00:17	0.82	0.04	0.13
C195	CONDUIT	13.72	0 00:17	1.04	0.04	0.16
C196	CONDUIT	17.41	0 00:17	0.94	0.08	0.20
C197	CONDUIT	21.02	0 00:17	0.26	0.05	0.34
C201	CONDUIT	10.00	0 00:12	0.44	1.34	0.59
C202	CONDUIT	42.07	0 00:17	0.28	1.48	0.53
C203	CONDUIT	71.48	0 00:17	0.82	0.06	0.35
C204	CONDUIT	142.03	0 00:17	1.10	6.45	0.47

****
Flow Classification Summary
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Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C135	1.00	0.04	0.37	0.00	0.60	0.00	0.00	0.09	0.0000
C137	1.00	0.04	0.00	0.00	0.95	0.02	0.00	0.40	0.0000
C138	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.18	0.0001
C139	1.00	0.04	0.35	0.00	0.62	0.00	0.00	0.09	0.0000
C140	1.00	0.04	0.00	0.00	0.78	0.18	0.00	0.42	0.0000
C141	1.00	0.04	0.01	0.00	0.77	0.18	0.00	0.45	0.0000
C176	1.00	0.04	0.16	0.00	0.79	0.01	0.00	0.23	0.0000
C177	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.20	0.0004
C183	1.00	0.04	0.00	0.00	0.65	0.31	0.00	0.91	0.0000
C184	1.00	0.06	0.94	0.00	0.00	0.00	0.00	0.00	0.0000
C185	1.00	0.04	0.02	0.00	0.94	0.00	0.00	0.12	0.0000
C186	1.00	0.04	0.00	0.00	0.84	0.12	0.00	0.37	0.0005
C187	1.00	0.04	0.02	0.00	0.77	0.18	0.00	0.45	0.0000
C188	1.00	0.04	0.00	0.00	0.73	0.23	0.00	0.51	0.0000
C189	1.00	0.04	0.38	0.00	0.58	0.00	0.00	0.05	0.0000
C190	1.00	0.04	0.00	0.00	0.77	0.19	0.00	0.44	0.0000
C191	1.00	0.04	0.00	0.00	0.77	0.19	0.00	0.44	0.0000
C192	1.00	0.04	0.00	0.00	0.82	0.15	0.00	0.35	0.0000
C193	1.00	0.04	0.18	0.00	0.78	0.00	0.00	0.06	0.0000
C194	1.00	0.04	0.00	0.00	0.77	0.20	0.00	0.45	0.0000
C195	1.00	0.04	0.00	0.00	0.74	0.22	0.00	0.49	0.0000
C196	1.00	0.04	0.00	0.00	0.80	0.17	0.00	0.41	0.0000

C197	1.00	0.04	0.34	0.00	0.63	0.00	0.00	0.00	0.05	0.0000
C201	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.00	0.10	0.0001
C202	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.05	0.0003
C203	1.00	0.04	0.00	0.00	0.96	0.00	0.00	0.00	0.20	0.0000
C204	1.00	0.04	0.00	0.00	0.00	0.00	0.00	0.96	0.35	0.0014

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Capacity Limited
C177	0.01	0.01	0.01	0.22	0.01
C186	0.01	0.01	0.01	0.27	0.01
C201	0.01	0.01	0.01	2.30	0.01
C202	0.01	0.01	0.01	0.17	0.01
C204	0.01	0.01	0.01	0.38	0.01

- Durata 45' – T_R100anni

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****
****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... YES
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date FEB-14-2012 00:00:00
Ending Date FEB-14-2012 02:30:00
Antecedent Dry Days 0.0
Report Time Step 00:00:30
Wet Time Step 00:00:05
Dry Time Step 00:00:30
Routing Time Step ..... 1.00 sec

********** Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.016	67.290
Evaporation Loss	0.000	0.000
Infiltration Loss	0.001	2.478
Surface Runoff	0.015	63.543
Final Surface Storage	0.000	1.270
Continuity Error (%)	0.000	

********** Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.015	0.148
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.008	0.081
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.007	0.067
Continuity Error (%)	0.230	

****
Time-Step Critical Elements

****
None
****
Highest Flow Instability Indexes
****
All links are stable.
****
Routing Time Step Summary
****
Minimum Time Step : 1.00 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 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 mm	Peak Runoff 10^6 ltr	Runoff Coeff LPS
S16	67.29	0.00	0.00	2.48	63.54	0.01	4.61	0.944
S15	67.29	0.00	0.00	2.48	63.54	0.01	8.64	0.944
S14	67.29	0.00	0.00	2.48	63.54	0.00	3.74	0.944
S12	67.29	0.00	0.00	2.48	63.55	0.00	2.64	0.944
S21	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S23	67.29	0.00	0.00	2.48	63.55	0.00	2.02	0.944
S17	67.29	0.00	0.00	2.48	63.54	0.01	4.61	0.944
S19	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S13	67.29	0.00	0.00	2.48	63.54	0.00	3.74	0.944
S11	67.29	0.00	0.00	2.48	63.55	0.00	2.64	0.944
S22	67.29	0.00	0.00	2.48	63.55	0.00	2.02	0.944
S20	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S18	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S4	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S6	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S8	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S10	67.29	0.00	0.00	2.48	63.54	0.01	4.32	0.944
S9	67.29	0.00	0.00	2.48	63.54	0.01	4.32	0.944
S7	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S5	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S3	67.29	0.00	0.00	2.48	63.55	0.00	2.88	0.944
S2	67.29	0.00	0.00	2.48	63.54	0.00	3.45	0.944
S138	67.29	0.00	0.00	2.48	63.54	0.01	6.23	0.944
S139	67.29	0.00	0.00	2.48	63.54	0.01	6.23	0.944
S140	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S141	67.29	0.00	0.00	2.48	63.54	0.01	5.76	0.944
S142	67.29	0.00	0.00	2.48	63.54	0.01	6.23	0.944
S143	67.29	0.00	0.00	2.48	63.54	0.01	6.23	0.944

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
J23	JUNCTION	0.01	0.04	41.44	0 00:25
J22	JUNCTION	0.01	0.05	40.75	0 00:25
J21	JUNCTION	0.01	0.06	39.96	0 00:25
J19	JUNCTION	0.05	0.17	39.27	0 00:25
J18	JUNCTION	0.04	0.19	39.35	0 00:25
J17	JUNCTION	0.02	0.09	40.11	0 00:25
J15	JUNCTION	0.03	0.12	41.82	0 00:25
J13	JUNCTION	0.01	0.04	42.59	0 00:25
J16	JUNCTION	0.01	0.07	41.77	0 00:25
J14	JUNCTION	0.01	0.04	42.59	0 00:25
J174	JUNCTION	0.00	0.00	40.02	0 00:00
J175	JUNCTION	0.01	0.06	39.22	0 00:25
J176	JUNCTION	0.02	0.09	39.19	0 00:25
J177	JUNCTION	0.01	0.04	41.44	0 00:25
J178	JUNCTION	0.01	0.05	40.75	0 00:25
J179	JUNCTION	0.01	0.05	39.95	0 00:25
J180	JUNCTION	0.07	0.28	38.32	0 00:25

J181	JUNCTION	0.02	0.09	38.43	0	00:25
J182	JUNCTION	0.01	0.07	39.08	0	00:25
J183	JUNCTION	0.01	0.05	40.11	0	00:25
J184	JUNCTION	0.01	0.04	41.45	0	00:25
J185	JUNCTION	0.01	0.05	41.46	0	00:25
J186	JUNCTION	0.01	0.05	40.65	0	00:25
J187	JUNCTION	0.01	0.07	39.08	0	00:25
J188	JUNCTION	0.02	0.08	38.42	0	00:25
J189	JUNCTION	0.07	0.28	38.32	0	00:25
Out4	OUTFALL	0.06	0.07	35.61	0	00:16
2	STORAGE	0.82	1.23	36.77	0	00:49

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
J23	JUNCTION	6.23	6.23	0 00:25	0.008	0.008
J22	JUNCTION	2.02	8.25	0 00:25	0.003	0.011
J21	JUNCTION	2.88	11.12	0 00:25	0.004	0.015
J19	JUNCTION	5.52	49.40	0 00:25	0.007	0.066
J18	JUNCTION	3.74	32.97	0 00:25	0.005	0.044
J17	JUNCTION	8.64	29.28	0 00:25	0.011	0.039
J15	JUNCTION	4.61	10.36	0 00:25	0.006	0.014
J13	JUNCTION	5.76	5.76	0 00:25	0.008	0.008
J16	JUNCTION	4.61	20.68	0 00:25	0.006	0.027
J14	JUNCTION	5.76	5.76	0 00:25	0.008	0.008
J174	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
J175	JUNCTION	3.74	3.74	0 00:25	0.005	0.005
J176	JUNCTION	2.64	55.62	0 00:25	0.003	0.074
J177	JUNCTION	6.23	6.23	0 00:25	0.008	0.008
J178	JUNCTION	2.02	8.25	0 00:25	0.003	0.011
J179	JUNCTION	2.88	11.12	0 00:25	0.004	0.015
J180	JUNCTION	5.76	33.12	0 00:25	0.008	0.044
J181	JUNCTION	2.88	16.29	0 00:25	0.004	0.022
J182	JUNCTION	2.88	13.42	0 00:25	0.004	0.018
J183	JUNCTION	4.32	10.55	0 00:25	0.006	0.014
J184	JUNCTION	6.23	6.23	0 00:25	0.008	0.008
J185	JUNCTION	6.23	6.23	0 00:25	0.008	0.008
J186	JUNCTION	4.32	10.55	0 00:25	0.006	0.014
J187	JUNCTION	2.88	13.42	0 00:25	0.004	0.018
J188	JUNCTION	2.88	16.29	0 00:25	0.004	0.022
J189	JUNCTION	6.33	110.83	0 00:25	0.008	0.148
Out4	OUTFALL	0.00	10.00	0 00:16	0.000	0.081
2	STORAGE	0.00	110.52	0 00:25	0.000	0.148

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Node Surcharge Summary
****
No nodes were surcharged.
****
Node Flooding Summary
****
No nodes were flooded.
****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
2	0.082	33	0	0.123	49	0 00:49	10.00

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
Out4	91.47	9.78	10.00	0.081

System 91.47 9.78 10.00 0.081
****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C135	CONDUIT	5.75	0 00:25	0.31	0.03	0.21
C137	CONDUIT	29.23	0 00:25	0.74	0.12	0.35
C138	CONDUIT	32.81	0 00:25	0.59	0.46	0.45
C139	CONDUIT	11.11	0 00:25	0.37	0.04	0.29
C140	CONDUIT	8.24	0 00:25	0.81	0.03	0.13
C141	CONDUIT	6.23	0 00:25	0.78	0.02	0.11
C176	CONDUIT	5.75	0 00:25	0.53	0.03	0.14
C177	CONDUIT	10.32	0 00:25	0.45	1.38	0.24
C183	CONDUIT	20.64	0 00:25	1.14	0.06	0.20
C184	CONDUIT	0.00	0 00:00	0.00	0.00	0.08
C185	CONDUIT	3.71	0 00:25	0.23	0.05	0.19
C186	CONDUIT	49.31	0 00:25	1.08	1.73	0.22
C187	CONDUIT	6.23	0 00:25	0.77	0.02	0.12
C188	CONDUIT	8.24	0 00:25	0.94	0.03	0.12
C189	CONDUIT	11.12	0 00:25	0.33	0.03	0.41
C190	CONDUIT	6.23	0 00:25	0.76	0.02	0.12
C191	CONDUIT	10.54	0 00:25	0.90	0.04	0.15
C192	CONDUIT	13.41	0 00:25	0.79	0.06	0.19
C193	CONDUIT	16.25	0 00:25	0.28	0.11	0.47
C194	CONDUIT	6.23	0 00:25	0.75	0.03	0.12
C195	CONDUIT	10.54	0 00:25	0.96	0.03	0.14
C196	CONDUIT	13.41	0 00:25	0.87	0.06	0.18
C197	CONDUIT	16.25	0 00:25	0.23	0.04	0.30
C201	CONDUIT	10.00	0 00:16	0.44	1.34	0.59
C202	CONDUIT	32.75	0 00:25	0.25	1.15	0.47
C203	CONDUIT	55.58	0 00:25	0.75	0.05	0.31
C204	CONDUIT	110.52	0 00:25	1.01	5.02	0.41

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
C135	1.00	0.05	0.20	0.00	0.74	0.00	0.00	0.12	0.0000
C137	1.00	0.05	0.00	0.00	0.93	0.02	0.00	0.44	0.0000
C138	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.21	0.0001
C139	1.00	0.05	0.20	0.00	0.75	0.00	0.00	0.11	0.0000
C140	1.00	0.05	0.00	0.00	0.68	0.27	0.00	0.54	0.0000
C141	1.00	0.05	0.01	0.00	0.67	0.26	0.00	0.58	0.0000
C176	1.00	0.05	0.10	0.00	0.83	0.02	0.00	0.31	0.0000
C177	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.23	0.0003
C183	1.00	0.05	0.00	0.00	0.56	0.39	0.00	0.97	0.0000
C184	1.00	0.07	0.93	0.00	0.00	0.00	0.00	0.00	0.0000
C185	1.00	0.05	0.02	0.00	0.93	0.00	0.00	0.14	0.0000
C186	1.00	0.05	0.00	0.00	0.79	0.16	0.00	0.43	0.0004
C187	1.00	0.05	0.02	0.00	0.66	0.26	0.00	0.57	0.0000
C188	1.00	0.05	0.00	0.00	0.63	0.32	0.00	0.65	0.0000
C189	1.00	0.05	0.23	0.00	0.72	0.00	0.00	0.07	0.0000
C190	1.00	0.05	0.00	0.00	0.67	0.28	0.00	0.57	0.0000
C191	1.00	0.05	0.00	0.00	0.67	0.28	0.00	0.59	0.0000
C192	1.00	0.05	0.00	0.00	0.73	0.22	0.00	0.44	0.0000
C193	1.00	0.05	0.07	0.00	0.88	0.00	0.00	0.07	0.0000
C194	1.00	0.05	0.00	0.00	0.67	0.28	0.00	0.56	0.0000
C195	1.00	0.05	0.00	0.00	0.64	0.31	0.00	0.63	0.0000
C196	1.00	0.05	0.00	0.00	0.70	0.25	0.00	0.51	0.0000
C197	1.00	0.05	0.23	0.00	0.72	0.00	0.00	0.06	0.0000
C201	1.00	0.06	0.00	0.00	0.94	0.00	0.00	0.10	0.0001
C202	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.06	0.0003
C203	1.00	0.05	0.00	0.00	0.95	0.00	0.00	0.24	0.0000
C204	1.00	0.05	0.00	0.00	0.00	0.00	0.00	0.95	0.39	0.0011

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Capacity Limited
C177	0.01	0.01	0.01	0.22	0.01
C186	0.01	0.01	0.01	0.33	0.01
C201	0.01	0.01	0.01	2.23	0.01
C202	0.01	0.01	0.01	0.13	0.01
C204	0.01	0.01	0.01	0.55	0.01