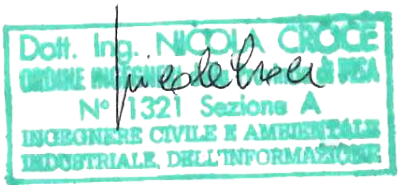
COMUNE DI SAN GIULIANO TERME



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DATA	PROGETTO	SIGLA
	REDAZIONE	
	GRAFICA	
	VALIDAZIONE	

committente

FONDAZIONE CASA CARDINALE MAFFI ONLUS
Sede Legale: via Don Pietro Parducci, 1 - 57023
San Pietro in Palazzi - Cecina (LI)

progetto

PROGETTO PER RESIDENZA SANITARIA ASSISTENZIALE
P.U.C.Scheda Norma Comparto n. 18 LOCALITA' MEZZANA

allegato

STUDIO IDROLOGICO IDRAULICA

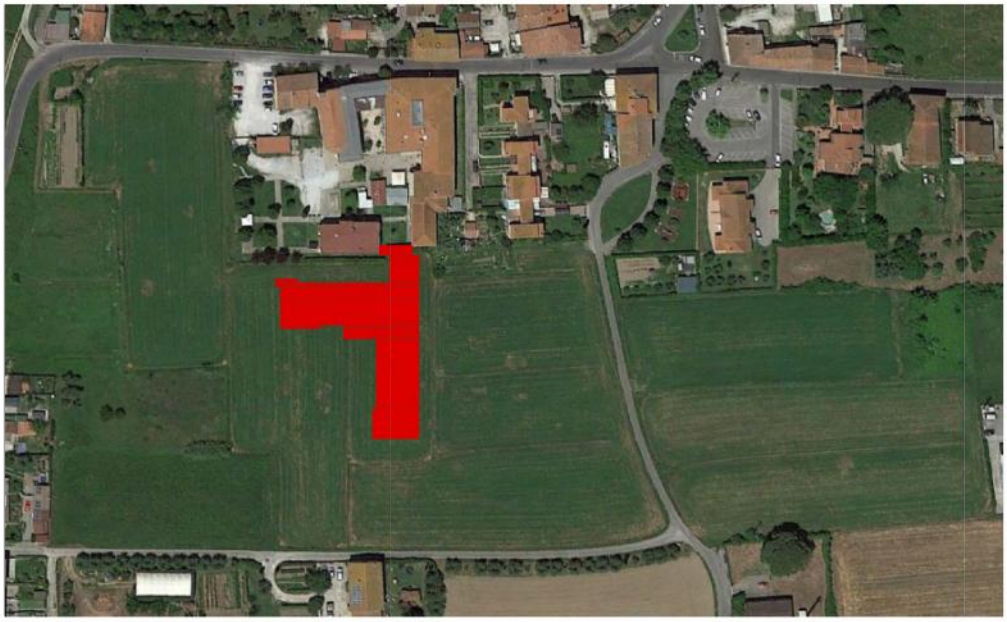
data Marzo 2021

all. A

Studio di Ingegneria Dott. Ing. Nicola Croce - Prof. Ing. Pietro Croce
via Carducci, 47 - 56010 Ghezzano (PI) e-mail: studiocroce@gmail.com tel./fax 050 878716

COMUNE DI SAN GIULIANO TERME (PI)

FONDAZIONE CASA CARDINALE MAFFI ONLUS
PROGETTO PER RESIDENZA SANITARIA ASSISTENZIALE
P.U.C. Scheda Norma Comparto n. 18 MEZZANA



FONDAZIONE CASA CARDINALE MAFFI ONLUS
Sede Legale: via Don Pietro Parducci, 1 - 57023 San Pietro In Palazzi - Cecina (LI)

Presidente Dott. Franco Falorni - Direttore generale Dott. Massimo Rapezzi

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RELAZIONE IDRAULICA.

Ing. Nicola Croce

Marzo 2021

Sommario

1. INQUADRAMENTO

L'intervento urbanistico si colloca in area a pericolosità idraulica P.2 ai sensi del Piano di Bacino Vigente (fig. 1), ovvero in Pericolosità Idraulica per Alluvioni Poco Frequenti ai sensi della L.R.T. n. 41/2018 e smi.

Pertanto, ai sensi della medesima Legge Regionale, possono essere realizzate opere di sopraelevazione, senza aggravio delle condizioni di rischio in altre aree (Art. 11 c.2 della L.R. 41/2018); i nuovi fabbricati devono essere realizzati, quindi, in condizioni di sicurezza idraulica con contestuale realizzazione di opere di compensazione.

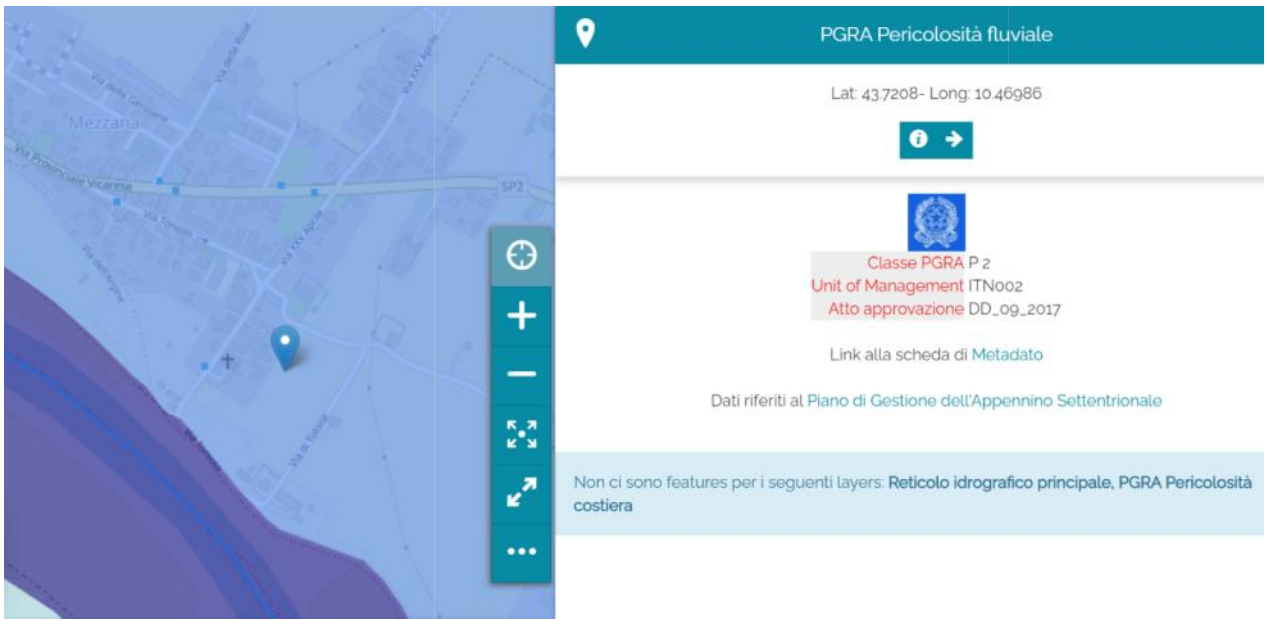


Fig. 1 – Estratto del PGRA vigente

2. BATTENTI TR 200

L'area oggetto di intervento non è interessata da eventi alluvionali del Fiume Arno; vi sono solamente fenomeni di stagnazione dovuti alla scarsa capacità del reticolo idraulico minore, come si evince dallo studio idraulico del Comune di San Giuliano Terme, di cui si riporta un estratto della mappa dei battenti (Fig. 2.1).

I battenti nel lotto di intervento sono stati evidenziati in fig. 2.2 ottenendo un **battente idraulico medio di 12 cm con TR200 anni**.

Di conseguenza è sufficiente garantire un rialzamento minimo del piano di calpestio dei fabbricati di 12cm più 30 cm di franco, rispetto al P.C. attuale, per raggiungere le condizioni di sicurezza idraulica, riferendosi ovviamente ad uno Zero topografico in prossimità dei fabbricati esistenti e lontano dalle fosse campestri.

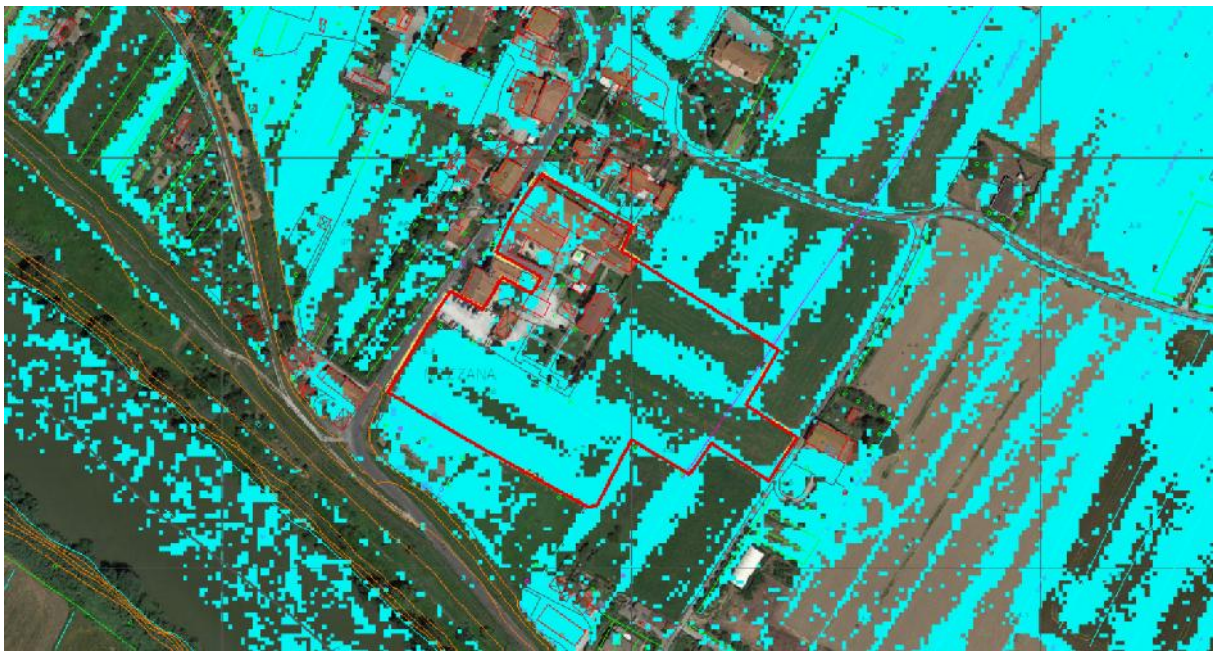


Fig. 2.1 – Battenti Tr 200 nell'area di intervento.

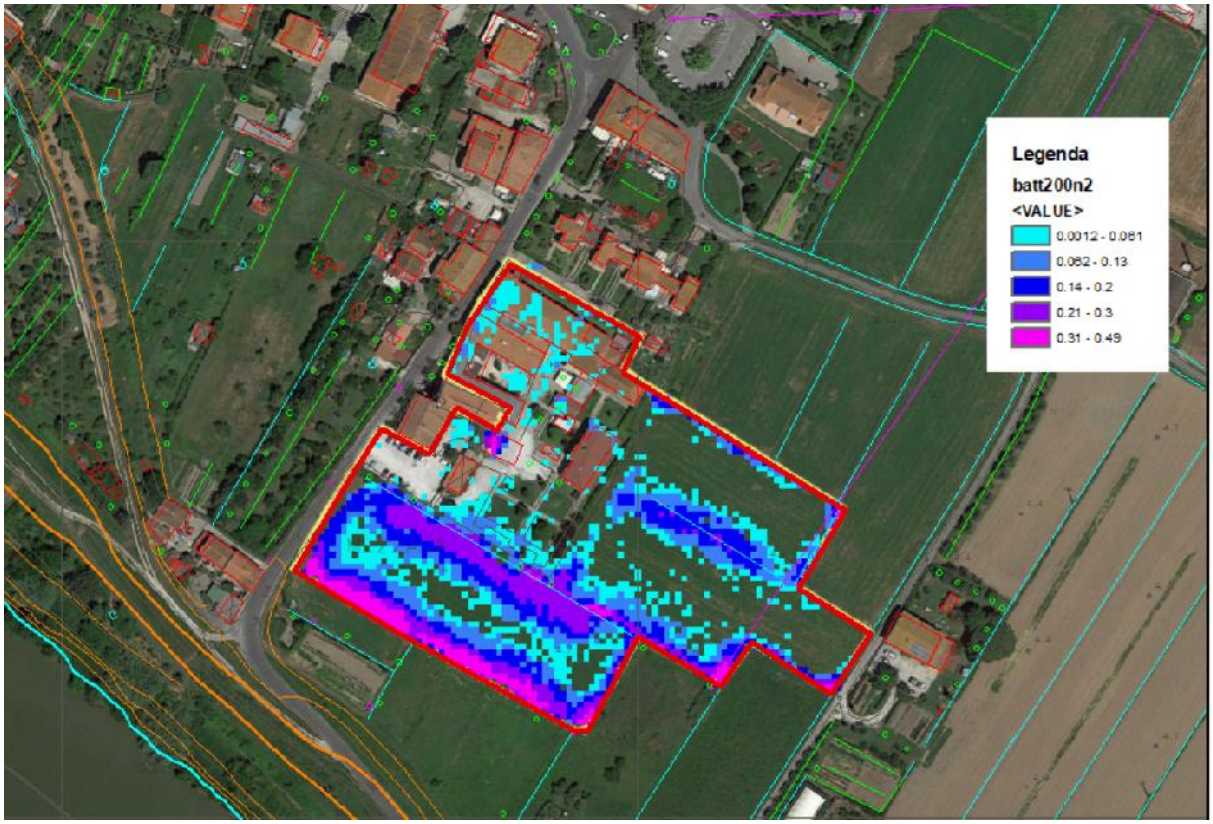
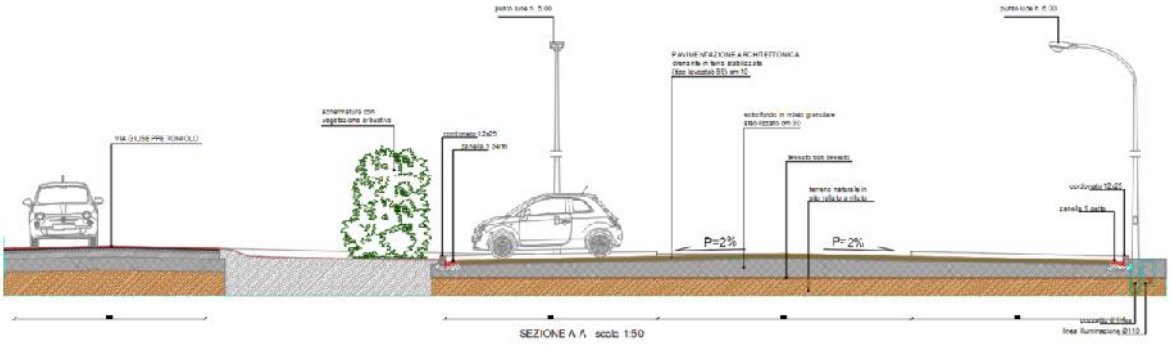


Fig. 2.2 – Battenti Tr 200 nel solo lotto di intervento. I valori variano tra 0 e 30 cm per raggiungere valori massimi di 49 cm nelle fosse campestri.

L'area di effettivo rialzamento, sulla base del progetto architettonico definitivo, è inferiore a quella interessata dall'allagamento: in particolare le aree adibite a parcheggio e verde circostante sono drenanti e non rialzate; parte di tali terreni saranno utilizzati, infatti per le casse di compensazione idraulica.



Da un'analisi di dettaglio si ricava la mappa dei battenti idraulici nelle aree oggetto di intervento urbanistico con conseguente rialzamento del Piano di calpestio:

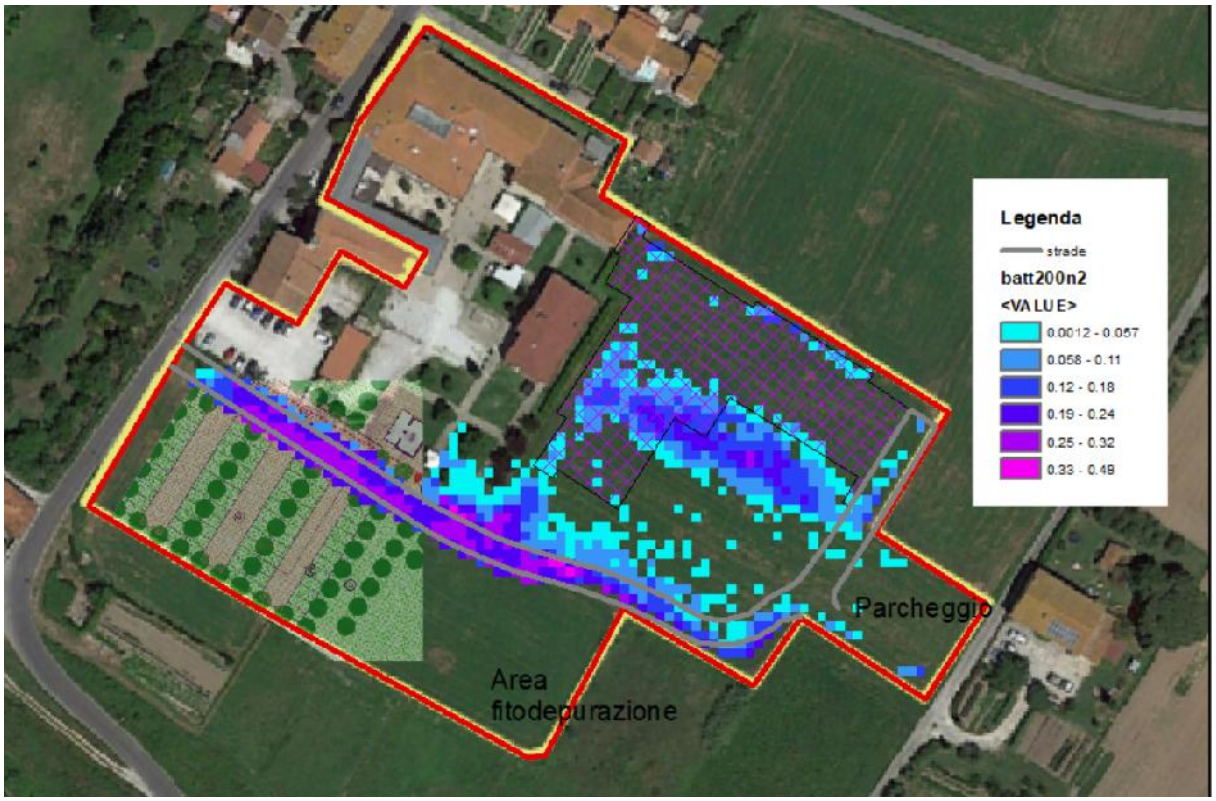


Fig. 2.3 – Battenti Tr 200 nell'area oggetto di intervento edilizio effettivo con rialzamento del P.C:. I valori variano tra 0 e 30 cm.

3. MISURE DI COMPENSAZIONE

Il calcolo accurato del conseguente volume di compenso conduce ad un valore di 284 mc sottratti all'esondazione:

	Dataset	Plane_Height	Reference	Z_Factor	Area_2D	Area_3D	Volume
▶	..014\MEZZANA\batt200n4_Clip.tif	0	ABOVE	1	1896	1897.058973	283.7185

A tale valore occorre aggiungere il volume dovuto all'invarianza idraulica che risulta essere pari a circa 100 mc per complessivi 390 mc (come meglio indicato nello studio di dettaglio della fognatura bianca di seguito indicato). Tale volume potrà essere stoccato in un'area come di seguito indicato di superficie di 680 mq circa:

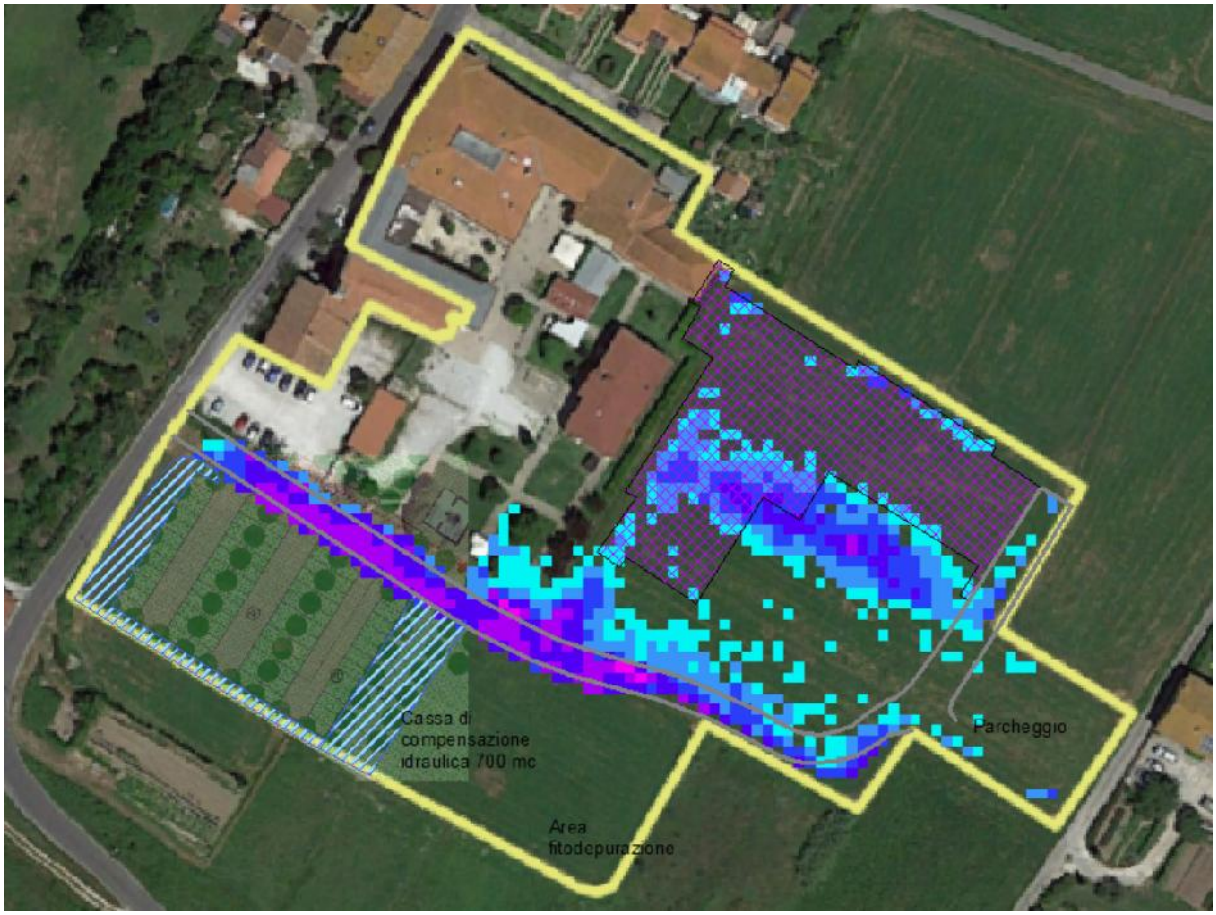


Fig. 3.1 – Battenti Tr200 con indicazione dell'area di compenso idraulico: sup. 680 mq.

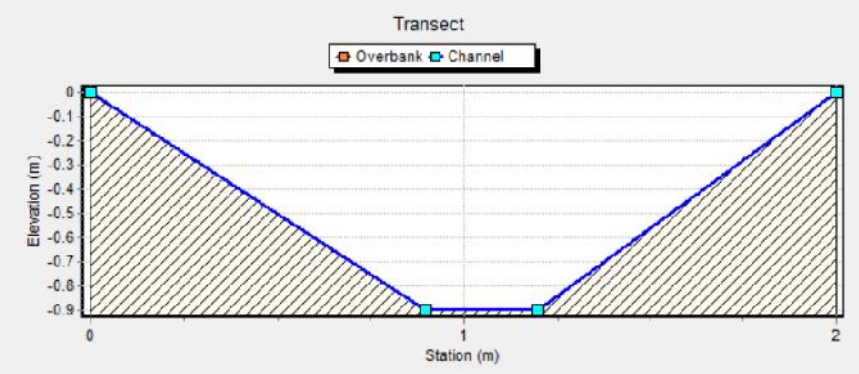
Detta area dovrà essere scavata nel terreno attuale in modo da ottenere il volume richiesto: il battente minimo nella cassa è quindi pari a 380/680 m = 0,56 m, cui deve essere sommato il franco idraulico e il dislivello tra la quota minima nel sito di ubicazione della cassa (3,9 m slm) e il P.C.ove sono ubicati i nuovi fabbricati(4,2 m slm); di conseguenza si prevede di scavare l'area di compenso di 1 m anche al fine di garantirne il riempimento a gravità mediante gli sfioratori che verranno ubicati sulla rete fognaria pluviale. Ciò è compatibile con i livelli di falda rilevati dal sondaggio più prossimo (-1,44 m dal P.C. attuale).

Dette casse dovranno essere protette da un bordo rialzato di circa 5 cm rispetto ai terreni circostanti onde impedirne l'allagamento in caso di eventi modesti ma prolungati.

4. MODELLO IDROLOGICO-IDRAULICO DELLA FOGNATURA PLUVIALE

Attraverso il software SWMM di E.P.A. si è provveduto alla simulazione del comportamento della rete di raccolta delle acque meteoriche; il tracciato è stato definito nell'ambito del progetto architettonico; nella presente relazione si è provveduto alla definizione dei diametri e delle tubazioni di sfioro verso la nuova cassa di compenso.

Lo scarico delle acque laminate avverrà, come previsto in progetto, nel fosso campestre di confine di cui è stato fatto un apposito rilievo topografico determinandone la sezione idraulica:



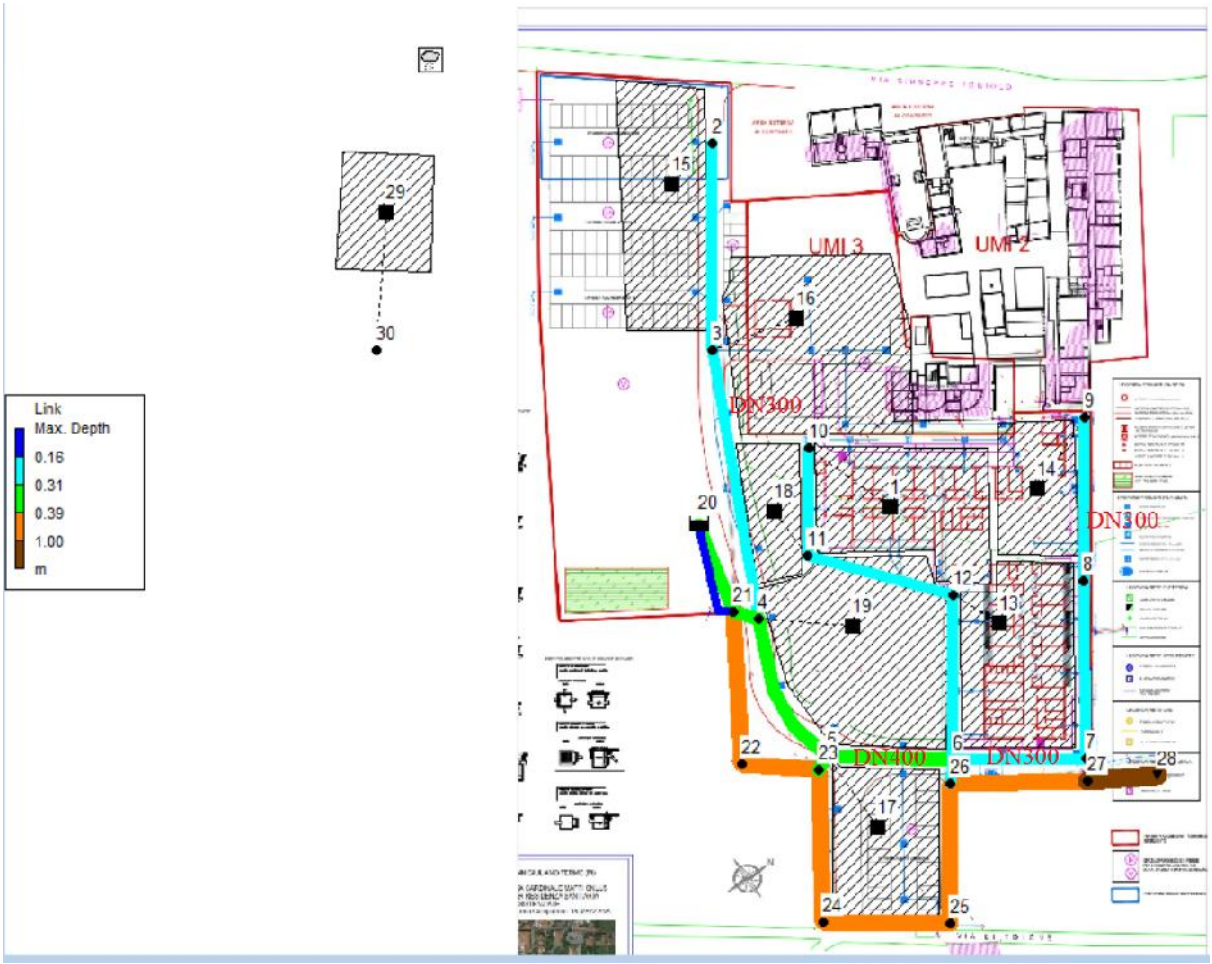


Fig. 4.1 – Modello idraulico SWMM con indicazione dei diametri delle condotte e altezza fosso campestre.

I nodi 4, 5 e 6 sono collegati rispettivamente ai nodi 21, 23 e 26 tramite tubazioni di sfioro:

- Il nodo 5 funge da scarico di tutta la rete tramite una tubazione DN 400 verso il nodo 23;
- Il nodo 4 ha funzione di sfioro delle acque di eccesso verso la cassa di compenso tramite una coppia di tubazioni DN 400, le qualirecapitano in un pozzetto di incrocio (nodo 21)e di lì allacassa (nodo 20) tramite una tubazione DN 400 L=53 m; onde evitare lo sfioro anche durante eventi pluviometrici normali, il fondo di detti tubi è posto a + 10 cm dal fondo della condotta principale nel punto di innesto; dette tubazioni sono dotate di clapet antiriflusso; Il pozzetto scarica nel fosso campestre tramite una valvola a clapet DN300;
- Il nodo 6 è collegato al nodo 26 tramite una tubazione DN 300 e anch'essa ha funzione di sfioro.

Il fosso campestre dovrà essere oggetto di lieve risagomatura con le quote indicate in planimetria allegata alla presente. Inoltre gli sbocchi dei tubi nella cassa e nel fosso dovranno essere protetti da una piccola scogliera in massi naturali.

Vi è poi una tubazione DN150 per lo svuotamento della cassa.

Vedasi tavola grafica allegata.

4.1. STUDIO IDROLOGICO-IDRAULICO

I dati pluviometrici a base dei calcoli sono stati desunti dalle LSPP regionali ricavando i seguenti parametri della Curva di possibilità pluviometrica con tempo di ritorno duecentennale:

Tr 200:		
a=	89.27	mm
n=	0.311	

Il modello di afflusso - deflusso è stato condotto mediante il metodo SCS-CN assumendo un CN pari a 70 per il terreno nelle condizioni attuali (terreno ad uso rurale) e per le parti non oggetto di intervento edilizio, mentre si è assunto un CN pari a 90 per le superfici modificate al netto di quelle pavimentate o coperte, assunte, nel modello, come impermeabili. Dette superfici sono state collegate alla rete pluviale come da progetto e questa al fosso ricettore e alla cassa di compenso.

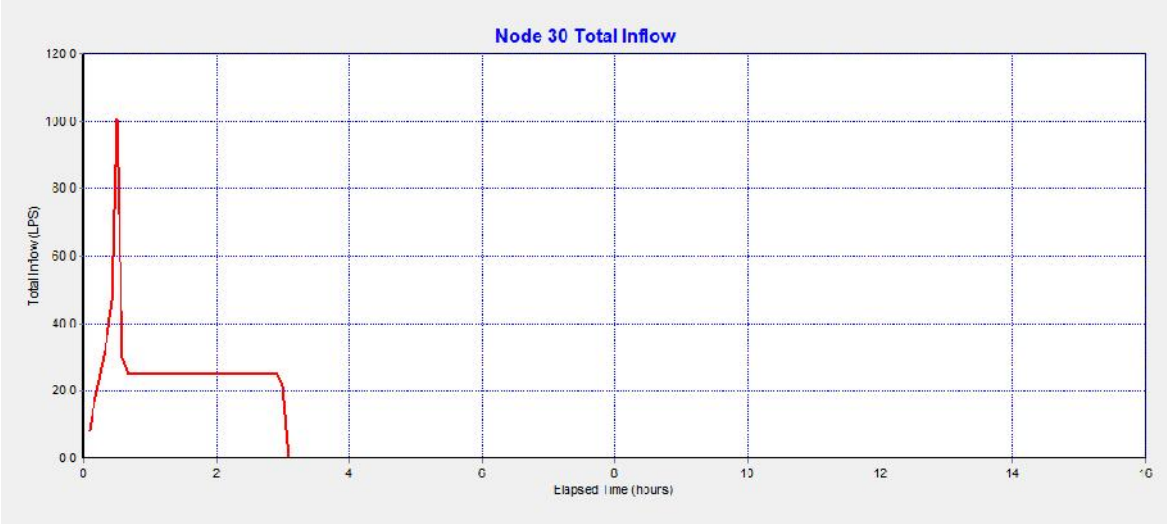
Son ostati simulati diversi scenari idrologici da 15' a 6 ore onde saggiare il comportamento della rete per i vari eventi pluviometrici significativi unitamente al volume sottratto all'esondazione (285 mc), proveniente dalle aree circostanti, che compete alla cassa di compenso ai fini della compensazione come precedentemente detto.

Si ha:

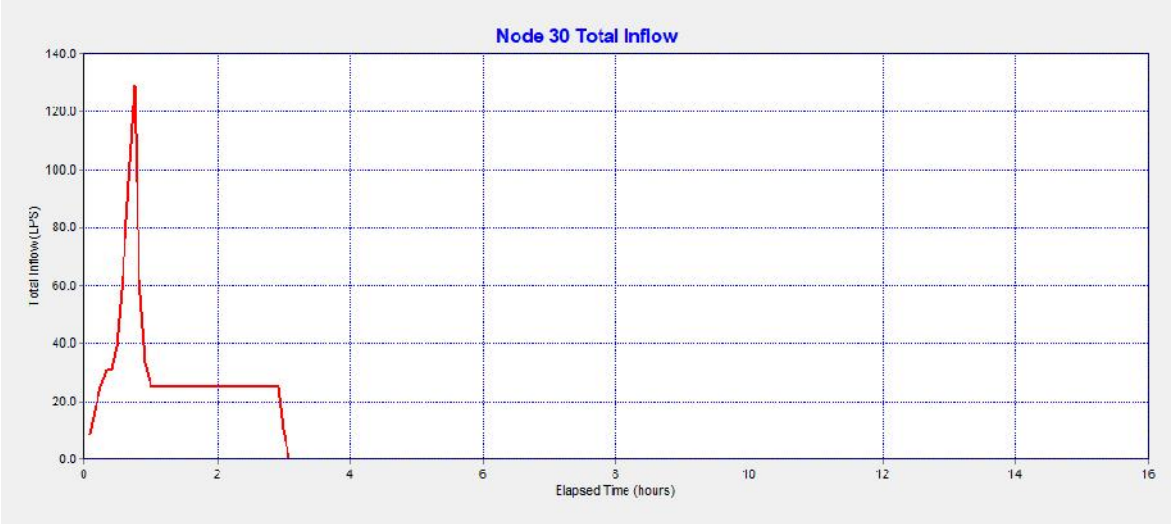
Tp 200:	15'	30'	1 ora	3ore	6ore
mm	58.00	71.96	89.27	125.63	155.85

4.2. RISULTATI DELLE SIMULAZIONI

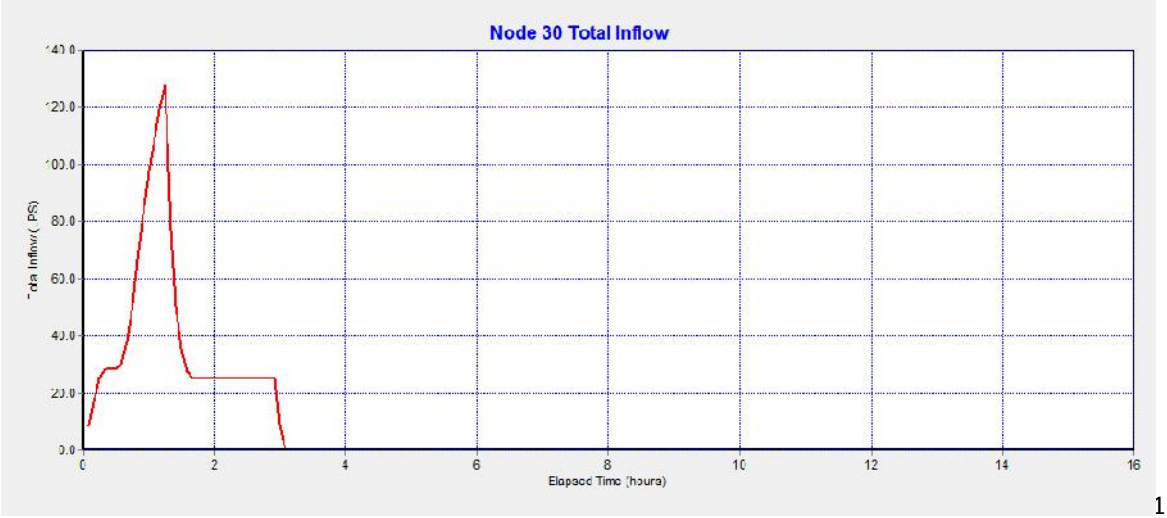
Idrogrammi Tr 200 del lotto stato attuale comprensivi del volume di esondazione:


Node 30 Total Inflow
Total Inflow (LPS)
Elapsed Time (hours)

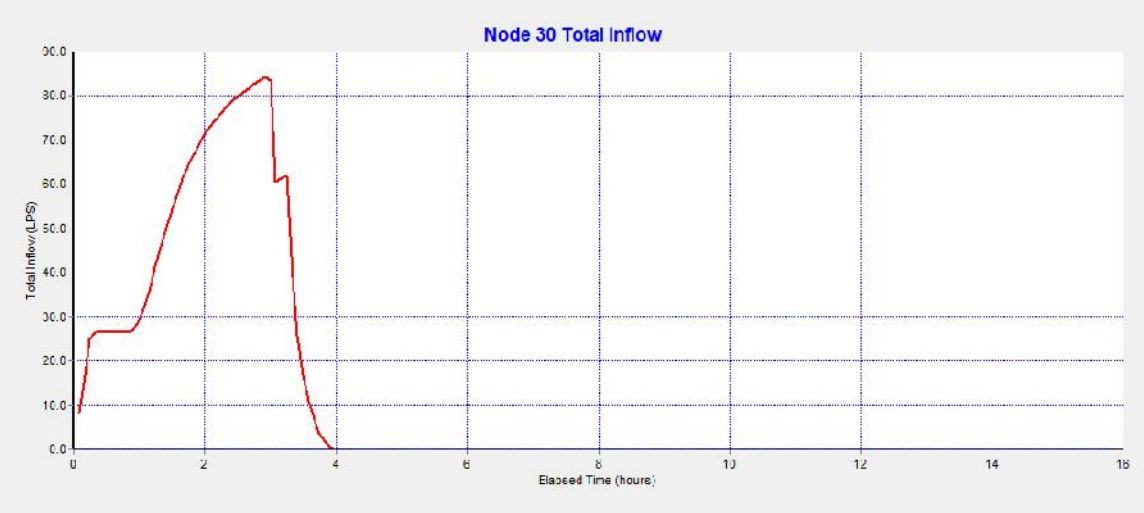
15’


Node 30 Total Inflow
Total Inflow (LPS)
Elapsed Time (hours)

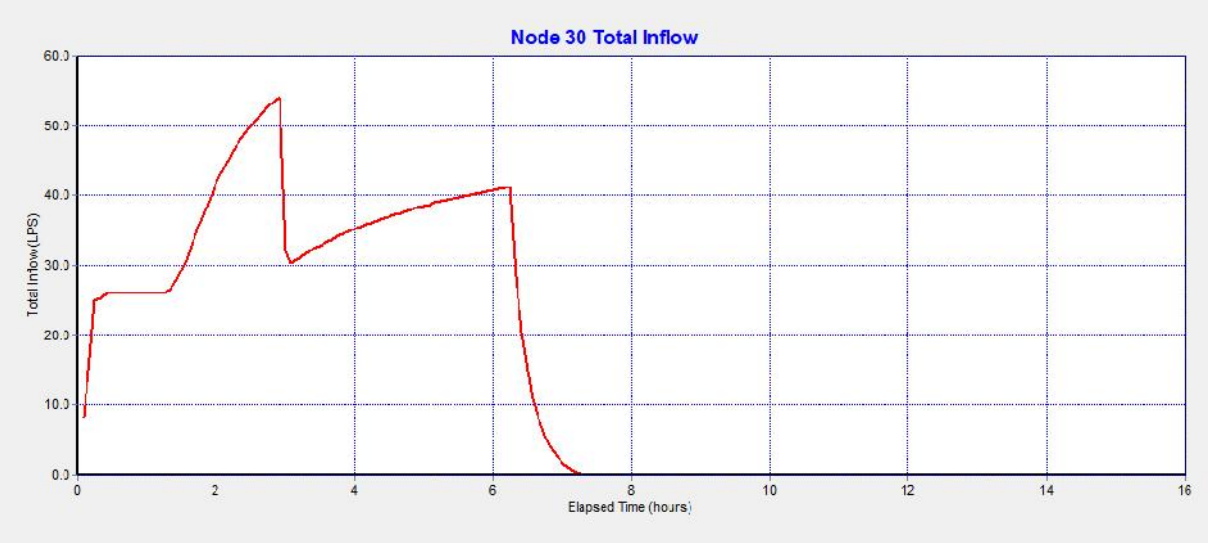
30’


Node 30 Total Inflow
Elapsed Time (hours)

1ora

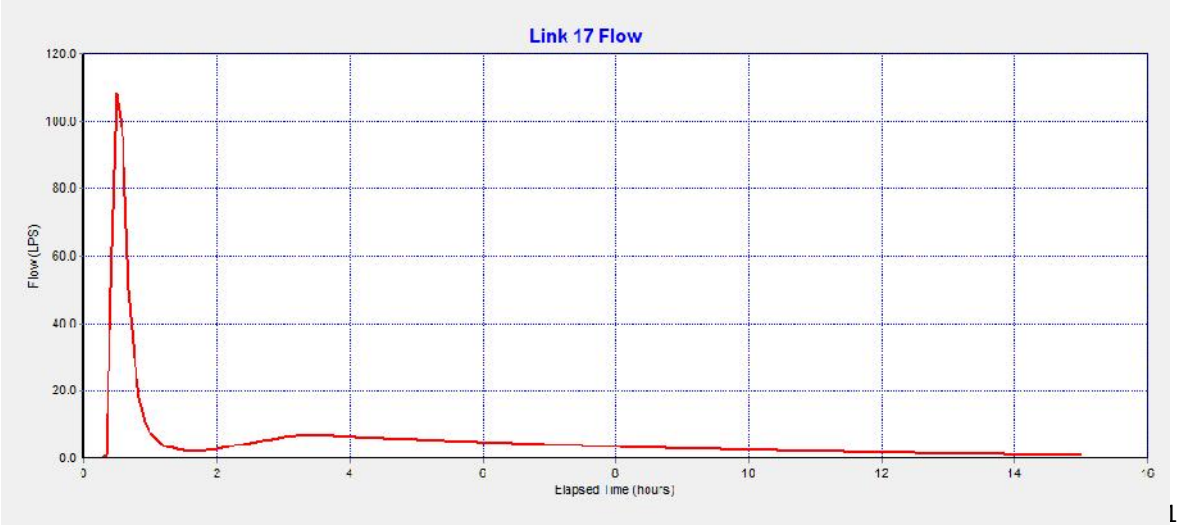


3 ore

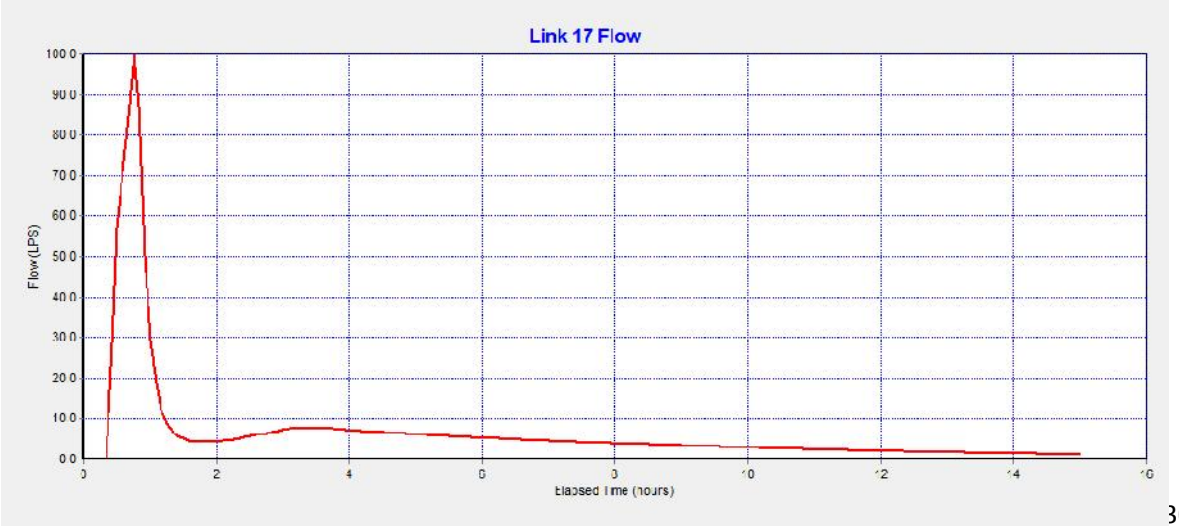


6 ore.

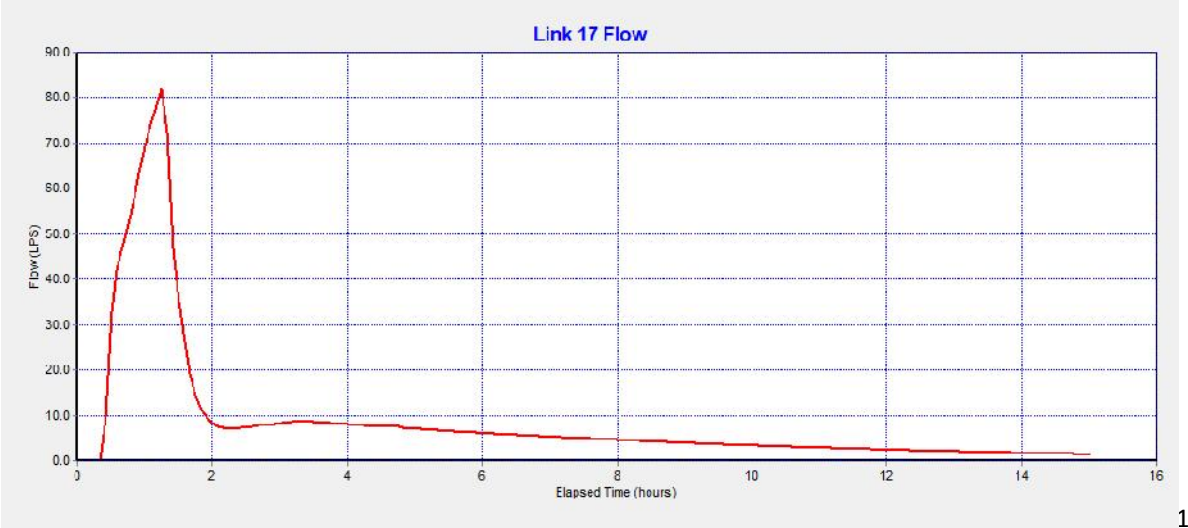
Idrogrammi Tr 200 del lotto stato modificatocomprensivi del volume di esondazione (laminato dalla cassa di compenso):


Link 17 Flow
Flow (LPS)
Elapsed Time (hours)

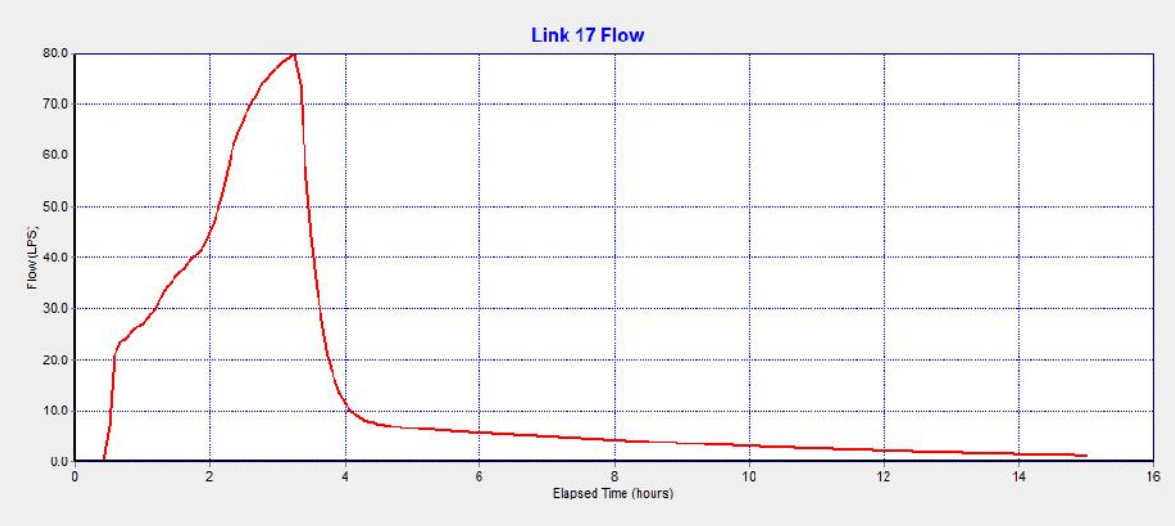
15’


Link 17 Flow
Flow (LPS)
Elapsed Time (hours)

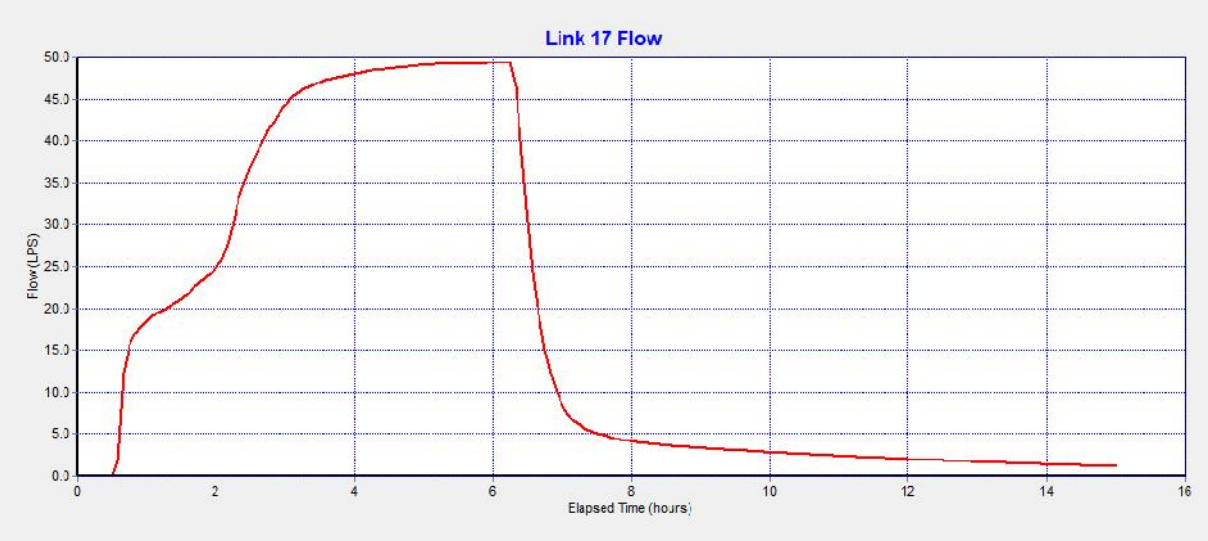
30’


Link 17 Flow
Flow (LPS)
Elapsed Time (hours)

1 ora

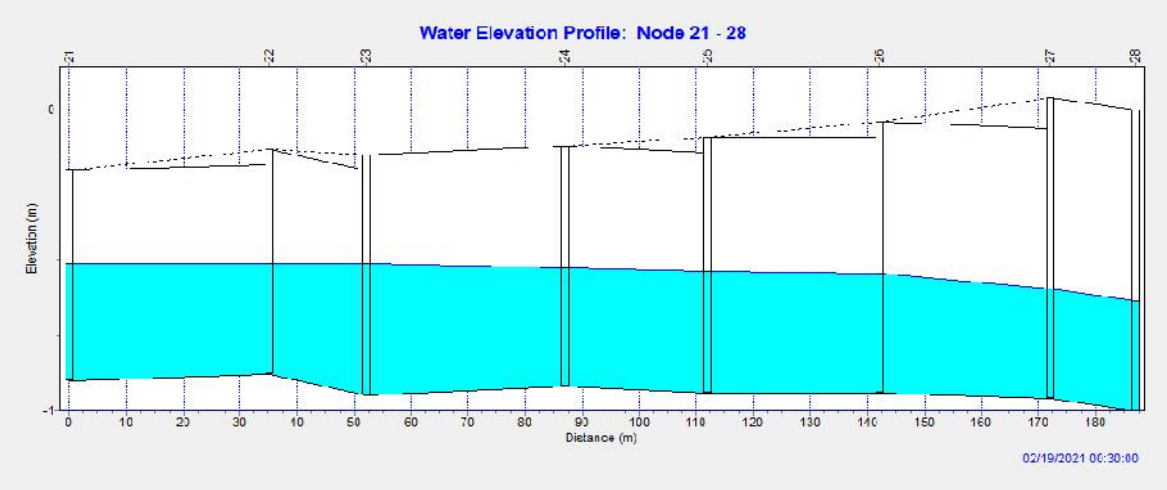


3 ore.

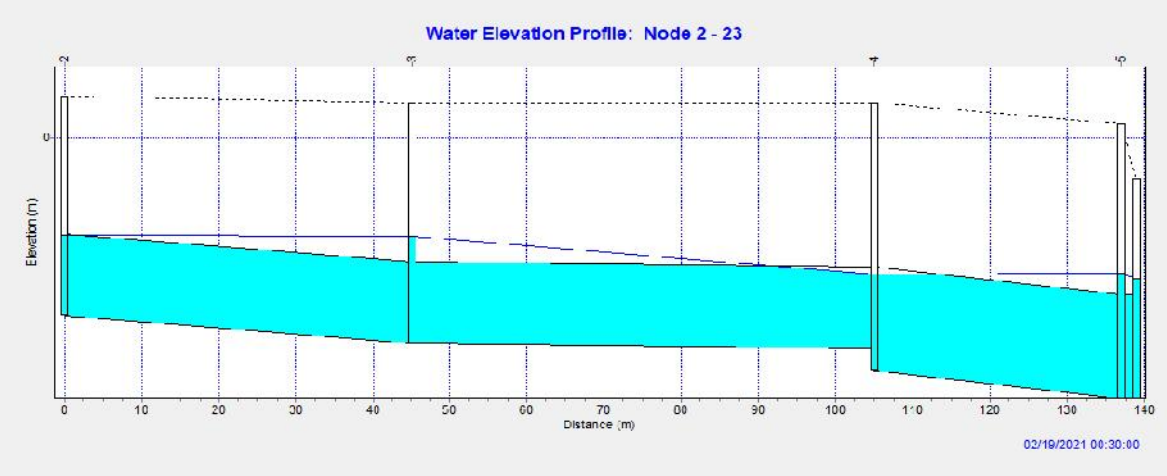


6 ore.

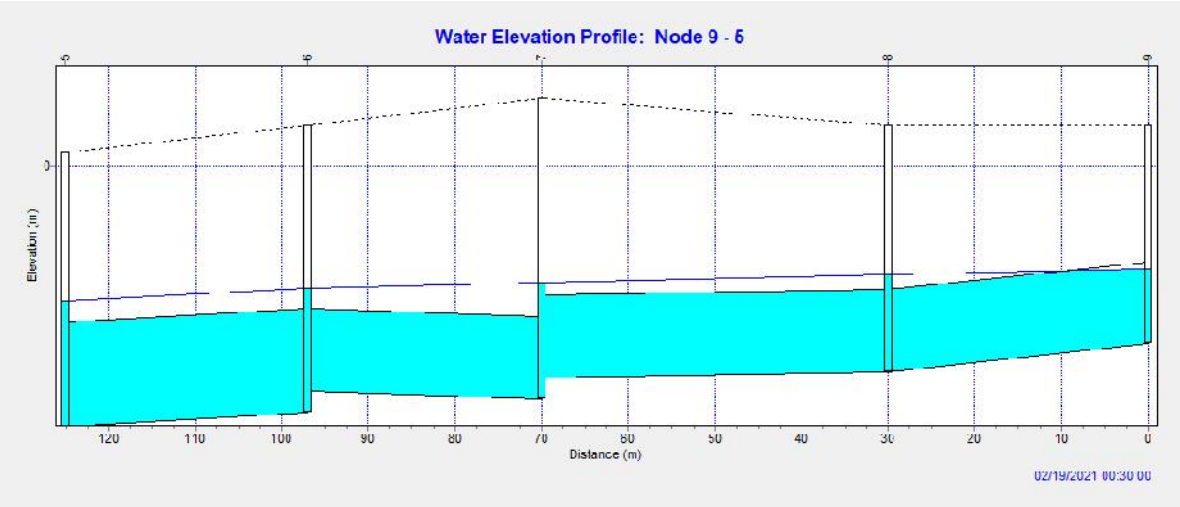
Profili idraulici Tr 200 tubazioni e fossa campestre:



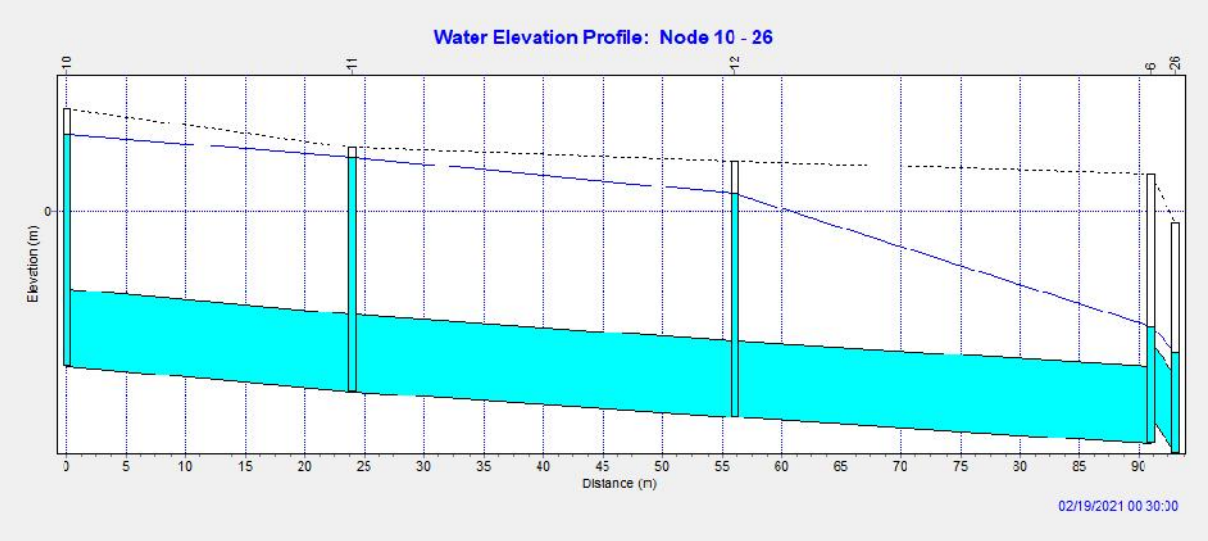
Fossa campestre



Condotte – dorsale principale

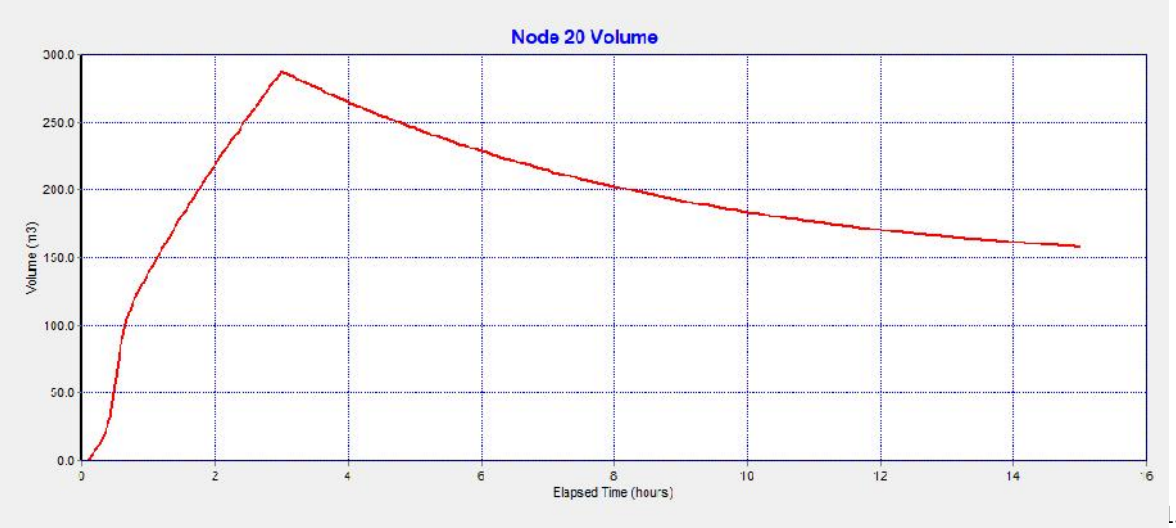


Condotte – dorsale laterale



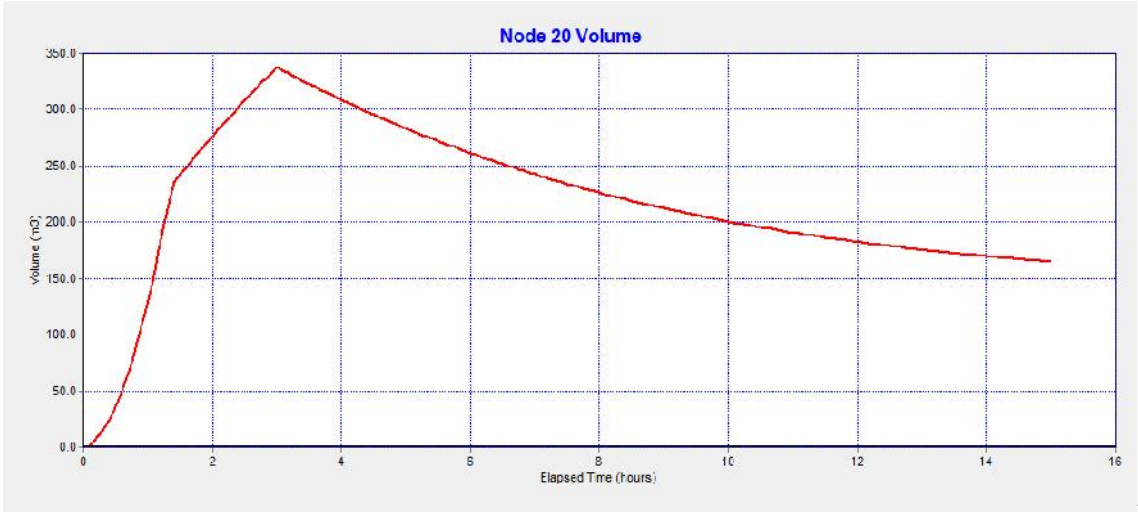
Condotte – tratto intermedio

Idrogrammi Cassa di compensocomprensivi del volume di esondazione: volume dinamico

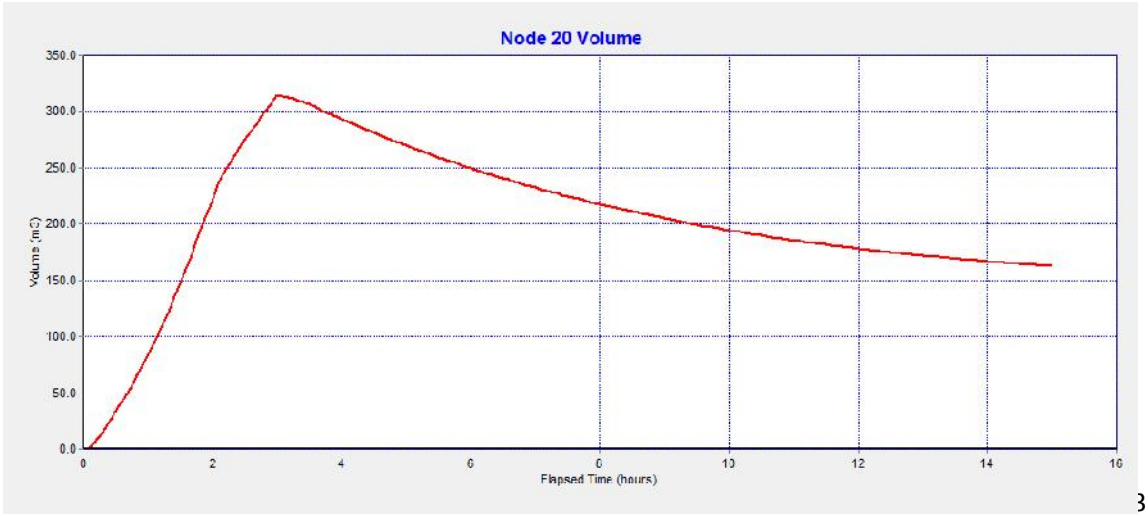


15’

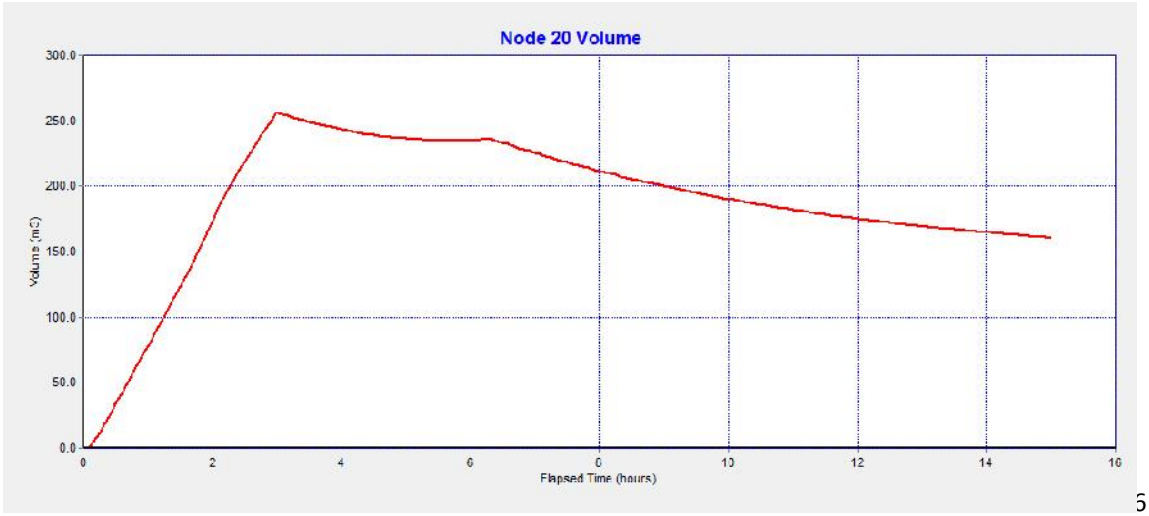
30’



ora



3 ore.



5 ore.

In allegato i tabulati del software.

5. CONCLUSIONI

Le simulazioni effettuate **mostrano l'invarianza idraulica del sistema** ed in particolare il deflusso nel fosso campestre ricettore ha un picco di portata di deflusso inferiore a quello dello stato attuale (Q_{max}= 125 l/s). In sintesi gli interventi previsti sono:

- Una Cassa di compenso di 680 mq con profondità 1 m dal P.C. attuale (rispetto allo stato di progetto la profondità è maggiore in ragione del rialzamento del piano di calpestio dei fabbricati con un minimo di 20 cm)
- Realizzazione di Parcheggi drenanti; quello di uso pubblico (sul lato di Via Toniolo posto a quota strada, cioè alla quota del piano di campagna corrispondente allo stato attuale) in modo da non aggravare il rischio idraulico;
- Opere di collettamento e sfioro come meglio indicato in planimetria llegata alla presente;

Ghezzano, Marzo 2021 Ing. Nicola Croce

Dott. Ing. NICOLA CROCE
ORDINE INGEGNERI di PISA
N° 1321 Sezione A
INGEGNERE CIVILE E AMBIENTALE
INDUSTRIALE, DELL'INFORMAZIONE

ALLEGATO: tabulati SWMM:

Schema idraulico:

Schema idraulico con i nodi della rete: il nodo n. 30 sintetizza i dati del bacino stato attuale.

Simulazione evento 15':

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 ..... NO

Water Quality ..... NO

Infiltration Method ..... CURVE_NUMBER

Flow Routing Method ..... DYNWAVE

Starting Date FEB-19-2021 00:00:00

Ending Date FEB-19-2021 15:00:00

Antecedent Dry Days 0.0

Report Time Step 00:05:00

Wet Time Step 00:05:00

Dry Time Step 01:00:00

Routing Time Step ..... 10.00 sec

WARNING 04: minimum elevation drop used for Conduit 15

WARNING 04: minimum elevation drop used for Conduit 19

********** Volume Depth

Runoff Quantity Continuity hectare-m mm

********** --------- -------

Total Precipitation 0.087 58.000

Evaporation Loss 0.000 0.000

Infiltration Loss 0.066 43.919

Surface Runoff 0.022 14.791

Final Surface Storage 0.000 0.289

Continuity Error (%) ..... -1.722

********** Volume Volume

Flow Routing Continuity	hectare-m	10^6 ltr
**************************	---------	---------
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.022	0.222
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.052	0.518
External Outflow	0.028	0.285
Internal Outflow	0.029	0.292
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.016	0.160
Continuity Error (%)	0.248	

****

Highest Continuity Errors

****

Node 7 (-3.56%)

Node 3 (3.54%)

Node 8 (1.67%)

****

Time-Step Critical Elements

****

Link 20 (18.13%)

Link 19 (10.40%)

Link 21 (4.31%)

****

Highest Flow Instability Indexes

****

All links are stable.

****

Routing Time Step Summary

****

Minimum Time Step : 0.50 sec

Average Time Step : 6.99 sec

Maximum Time Step : 10.00 sec

Percent in Steady State : 0.00

Average Iterations per Step : 2.04

****

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
1	58.00	0.00	0.00	2.43	56.45	0.06	63.54	0.973
13	58.00	0.00	0.00	2.43	56.41	0.05	57.19	0.973
14	58.00	0.00	0.00	13.50	45.68	0.02	29.92	0.788
15	58.00	0.00	0.00	54.66	3.87	0.00	6.16	0.067
16	58.00	0.00	0.00	36.33	22.54	0.03	49.13	0.389
17	58.00	0.00	0.00	53.89	5.40	0.01	10.79	0.093
18	58.00	0.00	0.00	51.80	6.79	0.00	6.77	0.117
19	58.00	0.00	0.00	51.24	7.46	0.01	24.68	0.129
29	58.00	0.00	0.00	53.78	4.77	0.03	75.50	0.082

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Node Depth Summary

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	Average Depth	Maximum Depth	Maximum HGL	Time of Max Occurrence

Node	Type	Meters	Meters	Meters	days hr:min
2	JUNCTION	0.03	0.31	-0.34	0 00:30
3	JUNCTION	0.06	0.41	-0.34	0 00:29
4	JUNCTION	0.07	0.36	-0.49	0 00:30
5	JUNCTION	0.17	0.46	-0.49	0 00:30
6	JUNCTION	0.13	0.46	-0.44	0 00:30
7	JUNCTION	0.10	0.43	-0.42	0 00:30
8	JUNCTION	0.06	0.36	-0.39	0 00:30
9	JUNCTION	0.04	0.28	-0.37	0 00:30
10	JUNCTION	0.11	1.00	0.40	0 00:19
11	JUNCTION	0.12	0.92	0.22	0 00:19
12	JUNCTION	0.13	0.87	0.07	0 00:30
21	JUNCTION	0.14	0.40	-0.50	0 00:30
22	JUNCTION	0.11	0.38	-0.50	0 00:31
23	JUNCTION	0.17	0.45	-0.50	0 00:31
24	JUNCTION	0.13	0.41	-0.51	0 00:31
25	JUNCTION	0.14	0.42	-0.52	0 00:31
26	JUNCTION	0.13	0.40	-0.54	0 00:31
27	JUNCTION	0.11	0.38	-0.58	0 00:31
30	JUNCTION	0.00	0.00	0.00	0 00:00
28	OUTFALL	0.11	0.38	-0.62	0 00:31
20	STORAGE	0.23	0.42	-0.58	0 03:00

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Node Inflow Summary

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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
2	JUNCTION	6.15	6.15	0 00:30	0.004	0.004
3	JUNCTION	49.11	53.32	0 00:30	0.034	0.038

4	JUNCTION	24.66	104.53	0	00:30	0.012	0.071
5	JUNCTION	10.78	88.91	0	00:30	0.005	0.074
6	JUNCTION	0.00	156.38	0	00:30	0.000	0.136
7	JUNCTION	0.00	29.73	0	00:30	0.000	0.023
8	JUNCTION	0.00	29.63	0	00:30	0.000	0.023
9	JUNCTION	29.92	29.92	0	00:30	0.023	0.023
10	JUNCTION	63.53	63.53	0	00:30	0.057	0.056
11	JUNCTION	6.76	70.29	0	00:30	0.003	0.060
12	JUNCTION	57.19	127.46	0	00:30	0.051	0.111
21	JUNCTION	0.00	103.29	0	00:30	0.000	0.233
22	JUNCTION	0.00	22.29	0	00:20	0.000	0.174
23	JUNCTION	0.00	67.05	0	00:30	0.000	0.223
24	JUNCTION	0.00	60.57	0	00:30	0.000	0.217
25	JUNCTION	0.00	58.12	0	00:31	0.000	0.220
26	JUNCTION	0.00	121.17	0	00:30	0.000	0.288
27	JUNCTION	0.00	118.20	0	00:31	0.000	0.285
30	JUNCTION	100.44	100.44	0	00:30	0.292	0.292
28	OUTFALL	0.00	117.34	0	00:31	0.000	0.285
20	STORAGE	25.00	109.27	0	00:31	0.259	0.322

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Node Surcharge Summary

****

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

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
2	JUNCTION	0.01	0.009	0.491
3	JUNCTION	0.08	0.114	0.466
5	JUNCTION	0.16	0.082	0.538
6	JUNCTION	0.09	0.055	0.595
7	JUNCTION	0.06	0.046	0.674
8	JUNCTION	0.06	0.057	0.543

10	JUNCTION	0.21	0.700	0.000
11	JUNCTION	0.23	0.624	0.026
12	JUNCTION	0.25	0.573	0.127
30	JUNCTION	15.00	0.000	0.000

****

Node Flooding Summary

****

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
10	0.01	18.53	0 00:19	0.000	1.00
30	3.00	100.41	0 00:30	0.292	0.00

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Storage Volume Summary

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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Loss Pcnt	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
20	0.157	19	0	0.288	35	0 03:00	7.27

****

Outfall Loading Summary

****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
28	97.63	20.05	117.34	0.285
System	97.63	20.05	117.34	0.285

****

Link Flow Summary

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Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	9.31	0 00:31	0.14	0.19	1.00
2	CONDUIT	53.32	0 00:30	0.76	2.79	0.97
3	CONDUIT	27.42	0 00:29	0.32	0.25	0.97
4	CONDUIT	78.17	0 00:29	0.82	0.94	1.00
6	CONDUIT	29.63	0 00:30	0.79	0.49	0.96
7	CONDUIT	29.73	0 00:30	0.45	1.27	1.00
8	CONDUIT	63.52	0 00:30	0.96	0.94	1.00
9	CONDUIT	70.31	0 00:30	0.99	1.20	1.00
10	CONDUIT	127.45	0 00:30	1.80	2.28	1.00
11	CONDUIT	13.20	0 00:30	0.15	0.05	0.55
12	CONDUIT	22.29	0 00:20	0.36	0.03	0.55
13	CONDUIT	60.57	0 00:30	0.34	0.15	0.53
14	CONDUIT	58.12	0 00:31	0.21	0.15	0.51
15	CONDUIT	59.74	0 00:32	0.35	1.21	0.48
16	CONDUIT	118.20	0 00:31	0.44	0.24	0.44
17	CONDUIT	117.34	0 00:31	0.53	0.11	0.38
19	CONDUIT	61.96	0 00:30	1.12	2.55	1.00
20	CONDUIT	78.23	0 00:30	1.61	0.28	1.00

21	CONDUIT	103.29	0	00:30	1.24	0.11	0.86
22	CONDUIT	84.27	0	00:31	1.05	0.90	0.67
23	CONDUIT	29.77	0	00:30	0.42	0.85	1.00
24	CONDUIT	7.27	0	03:00	0.50	0.72	1.00

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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	Froude Number	Avg. Flow Change
1	1.00	0.01	0.46	0.00	0.53	0.00	0.00	0.00	0.02	0.0001
2	1.00	0.01	0.00	0.00	0.21	0.00	0.00	0.78	0.19	0.0007
3	1.00	0.01	0.11	0.00	0.88	0.00	0.00	0.00	0.03	0.0001
4	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0003
6	1.00	0.01	0.10	0.00	0.89	0.00	0.00	0.00	0.09	0.0001
7	1.00	0.01	0.00	0.00	0.25	0.00	0.00	0.74	0.13	0.0003
8	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.14	0.0003
9	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.09	0.0004
10	1.00	0.01	0.09	0.00	0.90	0.00	0.00	0.00	0.05	0.0006
11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.10	0.0000
12	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.09	0.0000
13	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.11	0.0000
14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.13	0.0000
15	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.15	0.0005
16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.21	0.0001
17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.30	0.0000
19	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.05	0.0009
20	1.00	0.01	0.70	0.00	0.26	0.03	0.00	0.00	0.13	0.0001
21	1.00	0.02	0.73	0.00	0.23	0.02	0.00	0.00	0.11	0.0001
22	1.00	0.04	0.00	0.00	0.29	0.00	0.44	0.22	0.16	0.0002
23	1.00	0.01	0.00	0.00	0.31	0.00	0.67	0.00	0.04	0.0003
24	1.00	0.00	0.04	0.00	0.26	0.00	0.70	0.00	0.17	0.0002

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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
1	0.01	0.01	0.01	0.01	0.01
2	0.01	0.01	0.01	0.23	0.01
4	0.12	0.12	0.12	0.01	0.01
7	0.06	0.06	0.06	0.11	0.06
8	0.21	0.21	0.21	0.01	0.01
9	0.23	0.23	0.23	0.18	0.18
10	0.19	0.19	0.19	0.25	0.17
15	0.01	0.01	0.01	0.06	0.01
19	0.15	0.15	0.15	0.25	0.13
20	0.09	0.09	0.09	0.01	0.01
23	0.12	0.12	0.12	0.01	0.01
24	0.01	0.01	0.01	0.01	0.01

Analysis begun on: Wed Mar 03 15:13:21 2021

Analysis ended on: Wed Mar 03 15:13:21 2021

Total elapsed time: < 1 sec

Simulazione evento 30':

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 ..... NO

Water Quality ..... NO

Infiltration Method ..... CURVE_NUMBER

Flow Routing Method ..... DYNWAVE

Starting Date FEB-19-2021 00:00:00

Ending Date FEB-19-2021 15:00:00

Antecedent Dry Days 0.0

Report Time Step 00:05:00

Wet Time Step 00:05:00

Dry Time Step 01:00:00

Routing Time Step ..... 10.00 sec

WARNING 04: minimum elevation drop used for Conduit 15

WARNING 04: minimum elevation drop used for Conduit 19

********** Volume Depth

Runoff Quantity Continuity hectare-m mm

********** --------- -------

Total Precipitation 0.087 58.000

Evaporation Loss 0.000 0.000

Infiltration Loss 0.066 43.919

Surface Runoff 0.022 14.791

Final Surface Storage 0.000 0.289

Continuity Error (%) ..... -1.722

********** Volume Volume

Flow Routing Continuity hectare-m 10^6 ltr

********** --------- ---------

Dry Weather Inflow 0.000 0.000

Wet Weather Inflow 0.022 0.222

Groundwater Inflow 0.000 0.000

RDII Inflow 0.000 0.000

External Inflow 0.052 0.518

External Outflow 0.028 0.285

Internal Outflow 0.029 0.292

Storage Losses 0.000 0.000

Initial Stored Volume 0.000 0.000

Final Stored Volume 0.016 0.160

Continuity Error (%) 0.248

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Highest Continuity Errors

****

Node 7 (-3.56%)

Node 3 (3.54%)

Node 8 (1.67%)

****

Time-Step Critical Elements

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Link 20 (18.13%)

Link 19 (10.40%)

Link 21 (4.31%)

****

Highest Flow Instability Indexes

****

All links are stable.

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Routing Time Step Summary

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Minimum Time Step : 0.50 sec

Average Time Step : 6.99 sec

Maximum Time Step : 10.00 sec

Percent in Steady State : 0.00

Average Iterations per Step : 2.04

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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
1	58.00	0.00	0.00	2.43	56.45	0.06	63.54	0.973
13	58.00	0.00	0.00	2.43	56.41	0.05	57.19	0.973
14	58.00	0.00	0.00	13.50	45.68	0.02	29.92	0.788
15	58.00	0.00	0.00	54.66	3.87	0.00	6.16	0.067
16	58.00	0.00	0.00	36.33	22.54	0.03	49.13	0.389
17	58.00	0.00	0.00	53.89	5.40	0.01	10.79	0.093
18	58.00	0.00	0.00	51.80	6.79	0.00	6.77	0.117
19	58.00	0.00	0.00	51.24	7.46	0.01	24.68	0.129
29	58.00	0.00	0.00	53.78	4.77	0.03	75.50	0.082

****

Node Depth Summary

****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
2	JUNCTION	0.03	0.31	-0.34	0 00:30
3	JUNCTION	0.06	0.41	-0.34	0 00:29
4	JUNCTION	0.07	0.36	-0.49	0 00:30
5	JUNCTION	0.17	0.46	-0.49	0 00:30
6	JUNCTION	0.13	0.46	-0.44	0 00:30
7	JUNCTION	0.10	0.43	-0.42	0 00:30
8	JUNCTION	0.06	0.36	-0.39	0 00:30
9	JUNCTION	0.04	0.28	-0.37	0 00:30
10	JUNCTION	0.11	1.00	0.40	0 00:19
11	JUNCTION	0.12	0.92	0.22	0 00:19
12	JUNCTION	0.13	0.87	0.07	0 00:30
21	JUNCTION	0.14	0.40	-0.50	0 00:30
22	JUNCTION	0.11	0.38	-0.50	0 00:31
23	JUNCTION	0.17	0.45	-0.50	0 00:31
24	JUNCTION	0.13	0.41	-0.51	0 00:31
25	JUNCTION	0.14	0.42	-0.52	0 00:31
26	JUNCTION	0.13	0.40	-0.54	0 00:31
27	JUNCTION	0.11	0.38	-0.58	0 00:31
30	JUNCTION	0.00	0.00	0.00	0 00:00
28	OUTFALL	0.11	0.38	-0.62	0 00:31
20	STORAGE	0.23	0.42	-0.58	0 03:00

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Node Inflow Summary

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Node	Type	Maximum Lateral Inflow	Maximum Total Inflow	Time of Max Occurrence days hr:min	Lateral Inflow Volume	Total Inflow Volume

Node	Type	Inflow LPS	Inflow LPS	Occurrence days	hr:min	Volume 10^6 ltr	Volume 10^6 ltr
2	JUNCTION	6.15	6.15	0	00:30	0.004	0.004
3	JUNCTION	49.11	53.32	0	00:30	0.034	0.038
4	JUNCTION	24.66	104.53	0	00:30	0.012	0.071
5	JUNCTION	10.78	88.91	0	00:30	0.005	0.074
6	JUNCTION	0.00	156.38	0	00:30	0.000	0.136
7	JUNCTION	0.00	29.73	0	00:30	0.000	0.023
8	JUNCTION	0.00	29.63	0	00:30	0.000	0.023
9	JUNCTION	29.92	29.92	0	00:30	0.023	0.023
10	JUNCTION	63.53	63.53	0	00:30	0.057	0.056
11	JUNCTION	6.76	70.29	0	00:30	0.003	0.060
12	JUNCTION	57.19	127.46	0	00:30	0.051	0.111
21	JUNCTION	0.00	103.29	0	00:30	0.000	0.233
22	JUNCTION	0.00	22.29	0	00:20	0.000	0.174
23	JUNCTION	0.00	67.05	0	00:30	0.000	0.223
24	JUNCTION	0.00	60.57	0	00:30	0.000	0.217
25	JUNCTION	0.00	58.12	0	00:31	0.000	0.220
26	JUNCTION	0.00	121.17	0	00:30	0.000	0.288
27	JUNCTION	0.00	118.20	0	00:31	0.000	0.285
30	JUNCTION	100.44	100.44	0	00:30	0.292	0.292
28	OUTFALL	0.00	117.34	0	00:31	0.000	0.285
20	STORAGE	25.00	109.27	0	00:31	0.259	0.322

****

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
2	JUNCTION	0.01	0.009	0.491

3	JUNCTION	0.08	0.114	0.466
5	JUNCTION	0.16	0.082	0.538
6	JUNCTION	0.09	0.055	0.595
7	JUNCTION	0.06	0.046	0.674
8	JUNCTION	0.06	0.057	0.543
10	JUNCTION	0.21	0.700	0.000
11	JUNCTION	0.23	0.624	0.026
12	JUNCTION	0.25	0.573	0.127
30	JUNCTION	15.00	0.000	0.000

****

Node Flooding Summary

****

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
10	0.01	18.53	0 00:19	0.000	1.00
30	3.00	100.41	0 00:30	0.292	0.00

****

Storage Volume Summary

****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Loss Pcnt	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
20	0.157	19	0	0.288	35	0 03:00	7.27

****

Outfall Loading Summary

****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
28	97.63	20.05	117.34	0.285
System	97.63	20.05	117.34	0.285

****

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
1	CONDUIT	9.31	0	00:31	0.14	0.19	1.00
2	CONDUIT	53.32	0	00:30	0.76	2.79	0.97
3	CONDUIT	27.42	0	00:29	0.32	0.25	0.97
4	CONDUIT	78.17	0	00:29	0.82	0.94	1.00
6	CONDUIT	29.63	0	00:30	0.79	0.49	0.96
7	CONDUIT	29.73	0	00:30	0.45	1.27	1.00
8	CONDUIT	63.52	0	00:30	0.96	0.94	1.00
9	CONDUIT	70.31	0	00:30	0.99	1.20	1.00
10	CONDUIT	127.45	0	00:30	1.80	2.28	1.00
11	CONDUIT	13.20	0	00:30	0.15	0.05	0.55
12	CONDUIT	22.29	0	00:20	0.36	0.03	0.55
13	CONDUIT	60.57	0	00:30	0.34	0.15	0.53
14	CONDUIT	58.12	0	00:31	0.21	0.15	0.51

15	CONDUIT	59.74	0	00:32	0.35	1.21	0.48
16	CONDUIT	118.20	0	00:31	0.44	0.24	0.44
17	CONDUIT	117.34	0	00:31	0.53	0.11	0.38
19	CONDUIT	61.96	0	00:30	1.12	2.55	1.00
20	CONDUIT	78.23	0	00:30	1.61	0.28	1.00
21	CONDUIT	103.29	0	00:30	1.24	0.11	0.86
22	CONDUIT	84.27	0	00:31	1.05	0.90	0.67
23	CONDUIT	29.77	0	00:30	0.42	0.85	1.00
24	CONDUIT	7.27	0	03:00	0.50	0.72	1.00

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Flow Classification Summary

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	Adjusted /Actual	--- Fraction of Time in Flow Class ----							Avg.	Avg.
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Froude Number	Flow Change
1	1.00	0.01	0.46	0.00	0.53	0.00	0.00	0.00	0.02	0.0001
2	1.00	0.01	0.00	0.00	0.21	0.00	0.00	0.78	0.19	0.0007
3	1.00	0.01	0.11	0.00	0.88	0.00	0.00	0.00	0.03	0.0001
4	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0003
6	1.00	0.01	0.10	0.00	0.89	0.00	0.00	0.00	0.09	0.0001
7	1.00	0.01	0.00	0.00	0.25	0.00	0.00	0.74	0.13	0.0003
8	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.14	0.0003
9	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.09	0.0004
10	1.00	0.01	0.09	0.00	0.90	0.00	0.00	0.00	0.05	0.0006
11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.10	0.0000
12	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.09	0.0000
13	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.11	0.0000
14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.13	0.0000
15	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.15	0.0005
16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.21	0.0001
17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.30	0.0000
19	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.05	0.0009

20	1.00	0.01	0.70	0.00	0.26	0.03	0.00	0.00	0.13	0.0001
21	1.00	0.02	0.73	0.00	0.23	0.02	0.00	0.00	0.11	0.0001
22	1.00	0.04	0.00	0.00	0.29	0.00	0.44	0.22	0.16	0.0002
23	1.00	0.01	0.00	0.00	0.31	0.00	0.67	0.00	0.04	0.0003
24	1.00	0.00	0.04	0.00	0.26	0.00	0.70	0.00	0.17	0.0002

****

Conduit Surcharge Summary

****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full: Normal Flow	Capacity Limited
1	0.01	0.01	0.01	0.01	0.01
2	0.01	0.01	0.01	0.23	0.01
4	0.12	0.12	0.12	0.01	0.01
7	0.06	0.06	0.06	0.11	0.06
8	0.21	0.21	0.21	0.01	0.01
9	0.23	0.23	0.23	0.18	0.18
10	0.19	0.19	0.19	0.25	0.17
15	0.01	0.01	0.01	0.06	0.01
19	0.15	0.15	0.15	0.25	0.13
20	0.09	0.09	0.09	0.01	0.01
23	0.12	0.12	0.12	0.01	0.01
24	0.01	0.01	0.01	0.01	0.01

Analysis begun on: Wed Mar 03 15:13:21 2021

Analysis ended on: Wed Mar 03 15:13:21 2021

Total elapsed time: < 1 sec

Simulazione evento 1 ora:

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 ..... NO

Water Quality ..... NO

Infiltration Method ..... CURVE_NUMBER

Flow Routing Method ..... DYNWAVE

Starting Date FEB-19-2021 00:00:00

Ending Date FEB-19-2021 15:00:00

Antecedent Dry Days 0.0

Report Time Step 00:05:00

Wet Time Step 00:05:00

Dry Time Step 01:00:00

Routing Time Step ..... 10.00 sec

WARNING 04: minimum elevation drop used for Conduit 15

WARNING 04: minimum elevation drop used for Conduit 19

********** Volume Depth

Runoff Quantity Continuity hectare-m mm

**********	---------	-------
Total Precipitation	0.087	58.000
Evaporation Loss	0.000	0.000
Infiltration Loss	0.066	43.919
Surface Runoff	0.022	14.791
Final Surface Storage	0.000	0.289
Continuity Error (%)	-1.722	

**********	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
**********	---------	---------
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.022	0.222
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.052	0.518
External Outflow	0.028	0.285
Internal Outflow	0.029	0.292
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.016	0.160
Continuity Error (%)	0.248	

****

Highest Continuity Errors

****

Node 7 (-3.56%)

Node 3 (3.54%)

Node 8 (1.67%)

****

Time-Step Critical Elements

****

Link 20 (18.13%)

Link 19 (10.40%)

Link 21 (4.31%)

****

Highest Flow Instability Indexes

****

All links are stable.

****

Routing Time Step Summary

****

Minimum Time Step : 0.50 sec

Average Time Step : 6.99 sec

Maximum Time Step : 10.00 sec

Percent in Steady State : 0.00

Average Iterations per Step : 2.04

****

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
1	58.00	0.00	0.00	2.43	56.45	0.06	63.54	0.973
13	58.00	0.00	0.00	2.43	56.41	0.05	57.19	0.973
14	58.00	0.00	0.00	13.50	45.68	0.02	29.92	0.788
15	58.00	0.00	0.00	54.66	3.87	0.00	6.16	0.067
16	58.00	0.00	0.00	36.33	22.54	0.03	49.13	0.389
17	58.00	0.00	0.00	53.89	5.40	0.01	10.79	0.093
18	58.00	0.00	0.00	51.80	6.79	0.00	6.77	0.117
19	58.00	0.00	0.00	51.24	7.46	0.01	24.68	0.129

29	58.00	0.00	0.00	53.78	4.77	0.03	75.50	0.082

****

Node Depth Summary

****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
2	JUNCTION	0.03	0.31	-0.34	0 00:30
3	JUNCTION	0.06	0.41	-0.34	0 00:29
4	JUNCTION	0.07	0.36	-0.49	0 00:30
5	JUNCTION	0.17	0.46	-0.49	0 00:30
6	JUNCTION	0.13	0.46	-0.44	0 00:30
7	JUNCTION	0.10	0.43	-0.42	0 00:30
8	JUNCTION	0.06	0.36	-0.39	0 00:30
9	JUNCTION	0.04	0.28	-0.37	0 00:30
10	JUNCTION	0.11	1.00	0.40	0 00:19
11	JUNCTION	0.12	0.92	0.22	0 00:19
12	JUNCTION	0.13	0.87	0.07	0 00:30
21	JUNCTION	0.14	0.40	-0.50	0 00:30
22	JUNCTION	0.11	0.38	-0.50	0 00:31
23	JUNCTION	0.17	0.45	-0.50	0 00:31
24	JUNCTION	0.13	0.41	-0.51	0 00:31
25	JUNCTION	0.14	0.42	-0.52	0 00:31
26	JUNCTION	0.13	0.40	-0.54	0 00:31
27	JUNCTION	0.11	0.38	-0.58	0 00:31
30	JUNCTION	0.00	0.00	0.00	0 00:00
28	OUTFALL	0.11	0.38	-0.62	0 00:31
20	STORAGE	0.23	0.42	-0.58	0 03:00

****

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
2	JUNCTION	6.15	6.15	0 00:30	0.004	0.004
3	JUNCTION	49.11	53.32	0 00:30	0.034	0.038
4	JUNCTION	24.66	104.53	0 00:30	0.012	0.071
5	JUNCTION	10.78	88.91	0 00:30	0.005	0.074
6	JUNCTION	0.00	156.38	0 00:30	0.000	0.136
7	JUNCTION	0.00	29.73	0 00:30	0.000	0.023
8	JUNCTION	0.00	29.63	0 00:30	0.000	0.023
9	JUNCTION	29.92	29.92	0 00:30	0.023	0.023
10	JUNCTION	63.53	63.53	0 00:30	0.057	0.056
11	JUNCTION	6.76	70.29	0 00:30	0.003	0.060
12	JUNCTION	57.19	127.46	0 00:30	0.051	0.111
21	JUNCTION	0.00	103.29	0 00:30	0.000	0.233
22	JUNCTION	0.00	22.29	0 00:20	0.000	0.174
23	JUNCTION	0.00	67.05	0 00:30	0.000	0.223
24	JUNCTION	0.00	60.57	0 00:30	0.000	0.217
25	JUNCTION	0.00	58.12	0 00:31	0.000	0.220
26	JUNCTION	0.00	121.17	0 00:30	0.000	0.288
27	JUNCTION	0.00	118.20	0 00:31	0.000	0.285
30	JUNCTION	100.44	100.44	0 00:30	0.292	0.292
28	OUTFALL	0.00	117.34	0 00:31	0.000	0.285
20	STORAGE	25.00	109.27	0 00:31	0.259	0.322

****

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
2	JUNCTION	0.01	0.009	0.491
3	JUNCTION	0.08	0.114	0.466
5	JUNCTION	0.16	0.082	0.538
6	JUNCTION	0.09	0.055	0.595
7	JUNCTION	0.06	0.046	0.674
8	JUNCTION	0.06	0.057	0.543
10	JUNCTION	0.21	0.700	0.000
11	JUNCTION	0.23	0.624	0.026
12	JUNCTION	0.25	0.573	0.127
30	JUNCTION	15.00	0.000	0.000

****

Node Flooding Summary

****

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
10	0.01	18.53	0 00:19	0.000	1.00
30	3.00	100.41	0 00:30	0.292	0.00

****

Storage Volume Summary

****

Node	Average Volume 1000 ltr	Avg E&I Pcnt	Maximum Volume 1000 ltr	Max Pcnt	Time of Max Occurrence days hr:min	Maximum Outflow LPS

Storage Unit	Volume 1000 m3	Pcnt Full	Pcnt Loss	Volume 1000 m3	Pcnt Full	Occurrence days hr:min	Outflow LPS
20	0.157	19	0	0.288	35	0 03:00	7.27

****

Outfall Loading Summary

****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume 10^6 ltr
28	97.63	20.05	117.34	0.285
System	97.63	20.05	117.34	0.285

****

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
1	CONDUIT	9.31	0 00:31	0.14	0.19	1.00
2	CONDUIT	53.32	0 00:30	0.76	2.79	0.97
3	CONDUIT	27.42	0 00:29	0.32	0.25	0.97
4	CONDUIT	78.17	0 00:29	0.82	0.94	1.00
6	CONDUIT	29.63	0 00:30	0.79	0.49	0.96
7	CONDUIT	29.73	0 00:30	0.45	1.27	1.00
8	CONDUIT	63.52	0 00:30	0.96	0.94	1.00
9	CONDUIT	70.31	0 00:30	0.99	1.20	1.00

10	CONDUIT	127.45	0	00:30	1.80	2.28	1.00
11	CONDUIT	13.20	0	00:30	0.15	0.05	0.55
12	CONDUIT	22.29	0	00:20	0.36	0.03	0.55
13	CONDUIT	60.57	0	00:30	0.34	0.15	0.53
14	CONDUIT	58.12	0	00:31	0.21	0.15	0.51
15	CONDUIT	59.74	0	00:32	0.35	1.21	0.48
16	CONDUIT	118.20	0	00:31	0.44	0.24	0.44
17	CONDUIT	117.34	0	00:31	0.53	0.11	0.38
19	CONDUIT	61.96	0	00:30	1.12	2.55	1.00
20	CONDUIT	78.23	0	00:30	1.61	0.28	1.00
21	CONDUIT	103.29	0	00:30	1.24	0.11	0.86
22	CONDUIT	84.27	0	00:31	1.05	0.90	0.67
23	CONDUIT	29.77	0	00:30	0.42	0.85	1.00
24	CONDUIT	7.27	0	03:00	0.50	0.72	1.00

****

Flow Classification Summary

****

	Adjusted /Actual	--- Fraction of Time in Flow Class ----							Avg.	Avg.
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Froude Number	Flow Change
1	1.00	0.01	0.46	0.00	0.53	0.00	0.00	0.00	0.02	0.0001
2	1.00	0.01	0.00	0.00	0.21	0.00	0.00	0.78	0.19	0.0007
3	1.00	0.01	0.11	0.00	0.88	0.00	0.00	0.00	0.03	0.0001
4	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0003
6	1.00	0.01	0.10	0.00	0.89	0.00	0.00	0.00	0.09	0.0001
7	1.00	0.01	0.00	0.00	0.25	0.00	0.00	0.74	0.13	0.0003
8	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.14	0.0003
9	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.09	0.0004
10	1.00	0.01	0.09	0.00	0.90	0.00	0.00	0.00	0.05	0.0006
11	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.10	0.0000
12	1.00	0.01	0.01	0.00	0.98	0.00	0.00	0.00	0.09	0.0000
13	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.11	0.0000

14	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.00	0.13	0.0000
15	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.15	0.0005
16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.21	0.0001
17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.30	0.0000
19	1.00	0.01	0.00	0.00	0.98	0.00	0.00	0.00	0.05	0.0009
20	1.00	0.01	0.70	0.00	0.26	0.03	0.00	0.00	0.13	0.0001
21	1.00	0.02	0.73	0.00	0.23	0.02	0.00	0.00	0.11	0.0001
22	1.00	0.04	0.00	0.00	0.29	0.00	0.44	0.22	0.16	0.0002
23	1.00	0.01	0.00	0.00	0.31	0.00	0.67	0.00	0.04	0.0003
24	1.00	0.00	0.04	0.00	0.26	0.00	0.70	0.00	0.17	0.0002

****

Conduit Surcharge Summary

****

	Hours	Hours			
	--------- Hours Full --------			Above Full	Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
1	0.01	0.01	0.01	0.01	0.01
2	0.01	0.01	0.01	0.23	0.01
4	0.12	0.12	0.12	0.01	0.01
7	0.06	0.06	0.06	0.11	0.06
8	0.21	0.21	0.21	0.01	0.01
9	0.23	0.23	0.23	0.18	0.18
10	0.19	0.19	0.19	0.25	0.17
15	0.01	0.01	0.01	0.06	0.01
19	0.15	0.15	0.15	0.25	0.13
20	0.09	0.09	0.09	0.01	0.01
23	0.12	0.12	0.12	0.01	0.01
24	0.01	0.01	0.01	0.01	0.01

Analysis begun on: Wed Mar 03 15:13:21 2021

Analysis ended on: Wed Mar 03 15:13:21 2021

Total elapsed time: < 1 sec

Simulazione evento 3 ore:

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 ..... NO

Water Quality ..... NO

Infiltration Method ..... CURVE_NUMBER

Flow Routing Method ..... DYNWAVE

Starting Date FEB-19-2021 00:00:00

Ending Date FEB-19-2021 15:00:00

Antecedent Dry Days 0.0

Report Time Step 00:05:00

Wet Time Step 00:05:00

Dry Time Step 01:00:00

Routing Time Step ..... 10.00 sec

WARNING 04: minimum elevation drop used for Conduit 15

WARNING 04: minimum elevation drop used for Conduit 19

*************************** *Volume* *Depth*

Runoff Quantity Continuity *hectare-m* *mm*

*************************** --- ---

Total Precipitation 0.187 124.927

Evaporation Loss 0.000 0.000

Infiltration Loss 0.084 55.744

Surface Runoff 0.103 68.380

Final Surface Storage 0.002 1.083

Continuity Error (%) ..... -0.224

*************************** *Volume* *Volume*

Flow Routing Continuity *hectare-m* *10^6 ltr*

*************************** --- ---

Dry Weather Inflow 0.000 0.000

Wet Weather Inflow 0.103 1.026

Groundwater Inflow 0.000 0.000

RDII Inflow 0.000 0.000

External Inflow 0.052 0.518

External Outflow 0.072 0.724

Internal Outflow 0.065 0.654

Storage Losses 0.000 0.000

Initial Stored Volume 0.000 0.000

Final Stored Volume 0.017 0.165

Continuity Error (%) 0.021

****

Time-Step Critical Elements

****

Link 20 (40.77%)

Link 19 (38.35%)

****

Highest Flow Instability Indexes

****

All links are stable.

****

Routing Time Step Summary

****

Minimum Time Step : 0.50 sec

Average Time Step : 2.67 sec

Maximum Time Step : 10.00 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
1	124.93	0.00	0.00	2.71	121.75	0.12	11.53	0.975
13	124.93	0.00	0.00	2.71	121.80	0.11	10.38	0.975
14	124.93	0.00	0.00	13.74	110.71	0.06	5.68	0.886
15	124.93	0.00	0.00	81.55	42.27	0.04	7.42	0.338
16	124.93	0.00	0.00	37.90	86.28	0.13	15.74	0.691
17	124.93	0.00	0.00	77.13	46.92	0.05	7.72	0.376
18	124.93	0.00	0.00	65.42	59.08	0.03	4.48	0.473
19	124.93	0.00	0.00	64.69	59.83	0.10	14.40	0.479
29	124.93	0.00	0.00	67.48	56.45	0.40	62.01	0.452

****

Node Depth Summary

****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
2	JUNCTION	0.06	0.13	-0.52	0 03:15
3	JUNCTION	0.14	0.22	-0.53	0 03:15
4	JUNCTION	0.17	0.29	-0.56	0 03:15
5	JUNCTION	0.27	0.38	-0.57	0 03:15
6	JUNCTION	0.22	0.33	-0.57	0 03:15
7	JUNCTION	0.17	0.28	-0.57	0 03:15
8	JUNCTION	0.10	0.18	-0.57	0 03:15
9	JUNCTION	0.05	0.09	-0.56	0 03:15
10	JUNCTION	0.06	0.09	-0.51	0 03:15
11	JUNCTION	0.09	0.16	-0.54	0 03:15
12	JUNCTION	0.15	0.25	-0.55	0 03:15
21	JUNCTION	0.22	0.33	-0.57	0 03:15
22	JUNCTION	0.20	0.31	-0.57	0 03:15
23	JUNCTION	0.27	0.38	-0.57	0 03:15
24	JUNCTION	0.23	0.34	-0.58	0 03:15
25	JUNCTION	0.24	0.35	-0.59	0 03:15
26	JUNCTION	0.23	0.34	-0.60	0 03:15
27	JUNCTION	0.21	0.32	-0.64	0 03:15
30	JUNCTION	0.00	0.00	0.00	0 00:00
28	OUTFALL	0.21	0.32	-0.68	0 03:15
20	STORAGE	0.32	0.47	-0.53	0 03:00

****

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
2	JUNCTION	7.42	7.42	0 03:15	0.042	0.042
3	JUNCTION	15.74	23.12	0 03:15	0.129	0.172
4	JUNCTION	14.40	37.46	0 03:15	0.096	0.267
5	JUNCTION	7.72	27.87	0 03:15	0.047	0.219
6	JUNCTION	0.00	41.51	0 03:15	0.000	0.370
7	JUNCTION	0.00	5.63	0 03:15	0.000	0.055
8	JUNCTION	0.00	5.67	0 03:15	0.000	0.055
9	JUNCTION	5.68	5.68	0 03:15	0.055	0.055
10	JUNCTION	11.53	11.53	0 03:10	0.122	0.122
11	JUNCTION	4.48	16.00	0 03:15	0.030	0.151
12	JUNCTION	10.38	26.35	0 03:15	0.110	0.261
21	JUNCTION	0.00	20.90	0 03:15	0.000	0.314
22	JUNCTION	0.00	20.81	0 03:15	0.000	0.246
23	JUNCTION	0.00	39.00	0 03:15	0.000	0.410
24	JUNCTION	0.00	38.91	0 03:15	0.000	0.406
25	JUNCTION	0.00	38.83	0 03:15	0.000	0.406
26	JUNCTION	0.00	80.21	0 03:15	0.000	0.725
27	JUNCTION	0.00	80.14	0 03:15	0.000	0.724
30	JUNCTION	85.03	85.03	0 03:00	0.654	0.654
28	OUTFALL	0.00	80.11	0 03:15	0.000	0.724
20	STORAGE	25.00	43.81	0 01:44	0.259	0.328

****

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

5 JUNCTION 0.19 0.002 0.618

30 JUNCTION 15.00 0.000 0.000

****

Node Flooding Summary

****

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

Node	Total Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Maximum Flood Volume 10^6 ltr	Ponded Depth Meters
30	4.00	85.03	0 03:00	0.654	0.00

****

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
20	0.219	27	0	0.319	39	0 03:00	8.22

****

Outfall Loading Summary

****

Flow Freq.	Avg. Flow	Max. Flow	Total Volume

Outfall Node	Pcnt.	LPS	LPS	10^6 ltr
28	97.82	42.90	80.11	0.724
System	97.82	42.90	80.11	0.724

****

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
1	CONDUIT	7.51	0 03:16	0.19	0.15	0.59
2	CONDUIT	23.07	0 03:15	0.54	1.21	0.72
3	CONDUIT	20.16	0 03:15	0.22	0.18	0.88
4	CONDUIT	18.98	0 03:21	0.52	0.23	0.94
6	CONDUIT	5.67	0 03:15	0.50	0.09	0.46
7	CONDUIT	5.63	0 03:15	0.38	0.24	0.65
8	CONDUIT	11.52	0 02:55	0.67	0.17	0.41
9	CONDUIT	16.11	0 03:15	0.49	0.28	0.69
10	CONDUIT	26.32	0 03:15	0.69	0.47	0.92
11	CONDUIT	20.81	0 03:15	0.14	0.08	0.46
12	CONDUIT	20.89	0 03:15	0.18	0.02	0.46
13	CONDUIT	38.91	0 03:15	0.20	0.10	0.45
14	CONDUIT	38.83	0 03:15	0.25	0.10	0.43
15	CONDUIT	39.13	0 03:17	0.19	0.79	0.41
16	CONDUIT	80.14	0 03:15	0.39	0.16	0.37
17	CONDUIT	80.11	0 03:15	0.49	0.07	0.32
19	CONDUIT	18.28	0 03:15	0.80	0.75	1.00
20	CONDUIT	41.47	0 03:15	1.19	0.15	0.89
21	CONDUIT	19.90	0 01:55	0.75	0.02	0.70
22	CONDUIT	18.81	0 01:44	0.59	0.20	0.79
23	CONDUIT	5.98	0 03:16	0.19	0.17	0.89

24 CONDUIT 8.22 0 03:36 0.54 0.81 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	Up Crit	Avg. Froude Number	Avg. Flow Change
1	1.00	0.00	0.13	0.00	0.86	0.00	0.00	0.00	0.11	0.0000
2	1.00	0.00	0.00	0.00	0.55	0.00	0.00	0.44	0.36	0.0001
3	1.00	0.00	0.01	0.00	0.98	0.00	0.00	0.00	0.06	0.0000
4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000
6	1.00	0.00	0.03	0.00	0.96	0.00	0.00	0.00	0.27	0.0000
7	1.00	0.00	0.00	0.00	0.73	0.00	0.00	0.27	0.21	0.0000
8	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.50	0.0000
9	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.30	0.0000
10	1.00	0.00	0.01	0.00	0.98	0.00	0.00	0.00	0.25	0.0000
11	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.06	0.0000
12	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0000
13	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.11	0.0000
14	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.12	0.0000
15	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.12	0.0001
16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.24	0.0000
17	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.33	0.0000
19	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.07	0.0001
20	1.00	0.01	0.15	0.00	0.82	0.02	0.00	0.00	0.36	0.0000
21	1.00	0.03	0.19	0.00	0.76	0.01	0.01	0.00	0.13	0.0000
22	1.00	0.05	0.00	0.00	0.72	0.00	0.11	0.12	0.18	0.0000
23	1.00	0.01	0.00	0.00	0.88	0.00	0.11	0.00	0.08	0.0000
24	1.00	0.00	0.05	0.00	0.75	0.00	0.20	0.00	0.07	0.0001

****

Conduit Surcharge Summary

****

Conduit	Both Ends	Upstream	Dnstream	Hours Full	Hours Above Full	Capacity Limited
2	0.01	0.01	0.01	1.13	0.01	
19	0.05	0.05	0.05	0.01	0.05	
24	1.42	1.42	1.42	0.01	0.01	

Analysis begun on: Wed Mar 03 15:17:40 2021

Analysis ended on: Wed Mar 03 15:17:41 2021

Total elapsed time: 00:00:01

Simulazione evento 6 ore:

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 ..... NO

Water Quality ..... NO

Infiltration Method ..... CURVE_NUMBER

Flow Routing Method ..... DYNWAVE

Starting Date FEB-19-2021 00:00:00

Ending Date FEB-19-2021 15:00:00

Antecedent Dry Days 0.0

Report Time Step 00:05:00

Wet Time Step 00:05:00

Dry Time Step 01:00:00

Routing Time Step ..... 10.00 sec

WARNING 04: minimum elevation drop used for Conduit 15

WARNING 04: minimum elevation drop used for Conduit 19

**********	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
**********	---------	-------
Total Precipitation	0.232	154.808
Evaporation Loss	0.000	0.000
Infiltration Loss	0.088	58.794
Surface Runoff	0.142	94.835
Final Surface Storage	0.002	1.259
Continuity Error (%)	-0.051	

**********	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
**********	---------	---------
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.142	1.423
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.052	0.517
External Outflow	0.094	0.937
Internal Outflow	0.084	0.837
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000

Final Stored Volume 0.017 0.165

Continuity Error (%) 0.003

****

Time-Step Critical Elements

****

Link 20 (69.62%)

Link 19 (19.47%)

****

Highest Flow Instability Indexes

****

All links are stable.

****

Routing Time Step Summary

****

Minimum Time Step : 0.75 sec

Average Time Step : 1.85 sec

Maximum Time Step : 10.00 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
1	154.81	0.00	0.00	2.78	150.77	0.15	7.15	0.974
13	154.81	0.00	0.00	2.78	150.82	0.14	6.44	0.974
14	154.81	0.00	0.00	14.00	139.62	0.07	3.54	0.902
15	154.81	0.00	0.00	87.49	66.10	0.07	5.17	0.427
16	154.81	0.00	0.00	38.73	114.86	0.17	10.03	0.742

17	154.81	0.00	0.00	84.12	69.53	0.07	5.24	0.449
18	154.81	0.00	0.00	68.44	85.19	0.04	2.97	0.550
19	154.81	0.00	0.00	68.09	85.72	0.14	9.52	0.554
29	154.81	0.00	0.00	70.96	82.65	0.58	41.28	0.534

****

Node Depth Summary

****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
2	JUNCTION	0.05	0.07	-0.58	0 06:15
3	JUNCTION	0.12	0.16	-0.59	0 06:15
4	JUNCTION	0.16	0.21	-0.64	0 06:15
5	JUNCTION	0.26	0.31	-0.64	0 06:15
6	JUNCTION	0.21	0.26	-0.64	0 06:15
7	JUNCTION	0.16	0.21	-0.64	0 06:15
8	JUNCTION	0.08	0.11	-0.64	0 06:15
9	JUNCTION	0.04	0.05	-0.60	0 06:15
10	JUNCTION	0.06	0.07	-0.53	0 06:15
11	JUNCTION	0.07	0.09	-0.61	0 06:15
12	JUNCTION	0.13	0.17	-0.63	0 06:15
21	JUNCTION	0.20	0.26	-0.64	0 06:15
22	JUNCTION	0.19	0.24	-0.64	0 06:15
23	JUNCTION	0.25	0.31	-0.64	0 06:15
24	JUNCTION	0.22	0.27	-0.65	0 06:15
25	JUNCTION	0.23	0.28	-0.66	0 06:15
26	JUNCTION	0.22	0.27	-0.67	0 06:15
27	JUNCTION	0.20	0.25	-0.71	0 06:15
30	JUNCTION	0.00	0.00	0.00	0 00:00
28	OUTFALL	0.20	0.25	-0.75	0 06:15
20	STORAGE	0.31	0.39	-0.61	0 03:00

****

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
2	JUNCTION	5.17	5.17	0 06:15	0.066	0.066
3	JUNCTION	10.03	15.19	0 06:15	0.172	0.238
4	JUNCTION	9.52	24.70	0 06:15	0.137	0.375
5	JUNCTION	5.24	19.42	0 06:15	0.070	0.342
6	JUNCTION	0.00	28.64	0 06:15	0.000	0.529
7	JUNCTION	0.00	3.53	0 06:01	0.000	0.070
8	JUNCTION	0.00	3.54	0 06:15	0.000	0.070
9	JUNCTION	3.54	3.54	0 06:15	0.070	0.070
10	JUNCTION	7.15	7.15	0 06:15	0.151	0.151
11	JUNCTION	2.97	10.12	0 06:15	0.043	0.193
12	JUNCTION	6.44	16.55	0 06:15	0.136	0.329
21	JUNCTION	0.00	10.51	0 06:15	0.000	0.249
22	JUNCTION	0.00	10.14	0 04:35	0.000	0.236
23	JUNCTION	0.00	20.84	0 06:15	0.000	0.447
24	JUNCTION	0.00	20.83	0 06:15	0.000	0.444
25	JUNCTION	0.00	20.81	0 06:15	0.000	0.444
26	JUNCTION	0.00	49.43	0 06:15	0.000	0.938
27	JUNCTION	0.00	49.41	0 06:15	0.000	0.938
30	JUNCTION	54.76	54.76	0 02:59	0.837	0.837
28	OUTFALL	0.00	49.41	0 06:15	0.000	0.937
20	STORAGE	25.00	31.56	0 01:55	0.259	0.274

****

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
30	JUNCTION	15.00	0.000	0.000

****

Node Flooding Summary

****

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

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
30	7.33	54.76	0 02:59	0.837	0.00

****

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
20	0.210	26	0	0.262	32	0 03:00	5.18

****

Outfall Loading Summary

****

	Flow Avg.	Max.	Total

Outfall Node	Freq. Pcnt.	Flow LPS	Flow LPS	Volume 10^6 ltr
28	97.92	36.09	49.41	0.937
System	97.92	36.09	49.41	0.937

****

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
1	CONDUIT	5.17	0 06:15	0.21	0.10	0.40
2	CONDUIT	15.18	0 06:15	0.45	0.79	0.49
3	CONDUIT	14.18	0 06:15	0.18	0.13	0.68
4	CONDUIT	13.94	0 06:21	0.45	0.17	0.74
6	CONDUIT	3.54	0 06:15	0.36	0.06	0.27
7	CONDUIT	3.53	0 06:01	0.34	0.15	0.39
8	CONDUIT	7.15	0 06:15	0.58	0.11	0.26
9	CONDUIT	10.12	0 06:15	0.45	0.17	0.43
10	CONDUIT	16.55	0 06:15	0.62	0.30	0.70
11	CONDUIT	10.14	0 04:35	0.12	0.04	0.35
12	CONDUIT	10.60	0 06:19	0.14	0.01	0.36
13	CONDUIT	20.83	0 06:15	0.17	0.05	0.36
14	CONDUIT	20.81	0 06:15	0.22	0.05	0.34
15	CONDUIT	21.11	0 06:18	0.16	0.43	0.33
16	CONDUIT	49.41	0 06:15	0.33	0.10	0.29
17	CONDUIT	49.41	0 06:15	0.43	0.04	0.25
19	CONDUIT	12.11	0 00:31	0.65	0.50	0.80
20	CONDUIT	28.63	0 06:15	1.01	0.10	0.71
21	CONDUIT	10.51	0 06:15	0.46	0.01	0.50
22	CONDUIT	6.56	0 01:55	0.26	0.07	0.57

23	CONDUIT	3.82	0	06:17	0.17	0.11	0.64
24	CONDUIT	5.18	0	06:36	0.38	0.51	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
1	1.00	0.00	0.06	0.00	0.94	0.00	0.00	0.15	0.0000
2	1.00	0.00	0.00	0.00	0.67	0.00	0.33	0.41	0.0001
3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.10	0.0000
4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.06	0.0000
6	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.33	0.0000
7	1.00	0.00	0.00	0.00	0.73	0.00	0.27	0.23	0.0000
8	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.66	0.0000
9	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.38	0.0000
10	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.26	0.0000
11	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.06	0.0000
12	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.05	0.0000
13	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.10	0.0000
14	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.11	0.0000
15	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.11	0.0000
16	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.23	0.0000
17	1.00	0.02	0.00	0.00	0.98	0.00	0.00	0.33	0.0000
19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.07	0.0000
20	1.00	0.01	0.09	0.00	0.88	0.01	0.00	0.39	0.0000
21	1.00	0.04	0.10	0.00	0.84	0.02	0.00	0.11	0.0000
22	1.00	0.06	0.03	0.00	0.84	0.00	0.08	0.03	0.0000
23	1.00	0.00	0.00	0.00	0.91	0.00	0.08	0.08	0.0000
24	1.00	0.00	0.09	0.00	0.81	0.00	0.10	0.05	0.0001

****

Conduit Surcharge Summary

****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full: Normal Flow	Capacity Limited
24	2.91	2.91	2.91	0.01	0.01

Analysis begun on: Wed Mar 03 15:08:29 2021

Analysis ended on: Wed Mar 03 15:08:29 2021

Total elapsed time: < 1 sec

VIA GIUSEPPE TONIOLO

AREA ESTERNA AL COMPARTO

AREA ESTERNA AL COMPARTO

EDIFICIO ESISTENTE ALLACCIATO ALLA RETE FOGNARIA

EDIFICIO ESISTENTE ALLACCIATO ALLA RETE FOGNARIA

EDIFICIO ESISTENTE ALLACCIATO ALLA RETE FOGNARIA

UMI 3

UMI 2

AREA DI PARCHEGGIO USO PUBBLICO (mq 850)

PAVIMENTAZIONE DRENANTE

PAVIMENTAZIONE DRENANTE

PAVIMENTAZIONE DRENANTE

Fossa di scolo esistente acque campestri

cunetta di scolo acque cassa

-1,00

-0,9

-0,91

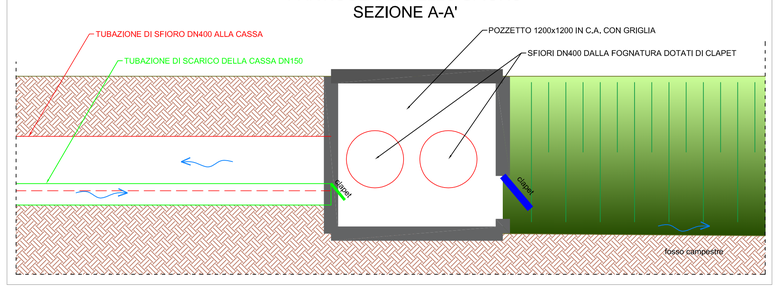
-0,75

CASSA DI COMPENSO
area utile mq 680
area lorda mq 693

POSA DI SCOGLIERA

POSA DI SCOGLIERA

PARTICOLARE DELLO SFIORO
SEZIONE A-A'



0,00

A

A'

-0,9

-0,8

-0,78

-0,85

-0,90

-0,70

-0,80

-0,65

-0,75

-0,90

-0,95

-0,95

-0,90

-0,94

-0,85

-1

Vasca raccolta acqua piovana - Lt. 5000

Troppo pieno

Fossa di scolo esistente acque campestri

Fossa di scolo esistente acque campestri

Fossa di scolo esistente acque campestri

Fossa di scolo esistente acque campestri

Fossa di scolo esistente acque campestri

PAVIMENTAZIONE DRENANTE

N

V I A D I T O L O N E

LEGENDA FOGNATURA BIANCA

- POZZETTO AL PIEDE DEL PLUVIALE
- POZZETTO SIFONATO CON ISPEZIONE ACQUE BIANCHE dim. interne 80x80
- POZZETTO IN CLS CON GRIGLIA ZINCATA
- STELLONE DI RACCOLTA ACQUE PIOVANE
- TRAVERSANTE ACQUE BIANCHE diam. 140 pvc a.r. p.0,004
- TUBAZIONE ACQUE BIANCHE diam. min. 300 pvc a.r. p.0,004
- POZZETTO DI ISPEZIONE 50 x 50 - h. var. (curva - braca)
- VASCA DI RACCOLTA ACQUA PIOVANA
- TUBAZIONE SFIORO CASSA diam.400 pvc
- TUBAZIONE PRINCIPALE diam.400 pvc
- TUBAZIONE SCARICO CASSA diam.150 pvc
- VALVOLA A CLAPET
- X.XX QUOTE DI FONDO

COMUNE DI SAN GIULIANO TERME

Dott. Ing. NICOLA CROCE
ORDINE INGEGNERI DI PISA
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INGEGNERIA CIVILE E AMBIENTALE
INDUSTRIALE DELL'INFORMAZIONE

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progetto
PROGETTO PER RESIDENZA SANITARIA ASSISTENZIALE
P.U.C.Scheda Norma Comparto n. 18 LOCALITA' MEZZANA

tavola
STUDIO IDROLOGICO IDRAULICA - TAVOLA GRAFICA

DATA	PROGETTO	SIGLA
	REDAZIONE	
	GRAFICA	
	VALIDAZIONE	

data Marzo 2021 scala 1.200 tav. UNICA