



Department of Public Works | 860.584.6125

MEMORANDUM

DATE: March 22, 2022

TO: Mayor Jeff Caggiano
Flood and Erosion Control Board

FROM: Raymond A. Rogozinski, P.E., Director of Public Works

RE: City Flooding / Drainage Issues

The Department of Public Works continues to address the various storm drainage issues identified during the heavy rains on July 19 (4 inches), August 19 (approx. 4.5 inches of rain within 1 hr.), August 29 (Tropical Storm Henri 5.5 inches of rain) and September 2 (Tropical Storm Ida 7 inches of rain) throughout the City. A summary of the drainage issues (original 11/x/21 memorandum report attached) along updated action (*italics*) is provided below:

1. Brace Avenue; Portion of Brace Avenue (south side) from Vera road to Cabot Street received water jumping the curb. They experienced flooding on the July 19 and August 29 storm events (high intensity). DPW jetted and cleaned the storm drainage system. Problem persists. DPW provided sandbags to contain water within roadway. DPW scheduled to confirm piping configuration in area of 106 Brace Ave catch basin is adequate. Appears section of storm drainage piping is undersized. Engineering evaluation/capital project may be required to upgrade system to stream west of Vine Road.

DPW Capital Improvement Project request \$750,000 to upgrade Brace Avenue storm drainage pending BOF approval.

2. Vine road / Duncan Street intersection: Standing water /flooding of intersection due to backup/capacity of receiving stream west of Vine Road. DPW to inspect stream located west of Vine Road to Stafford Ave to ensure there are no blockages.

DPW performed an inspection of the stream that City storm water discharges to in the rear properties of Vine Road. Several areas of debris have been identified and DPW is in the process of contracting property owners. In addition, the storm drainage has been cleaned/jetted by DPW and a video inspection has been scheduled.



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3. Beth Avenue/Hiltbrand Road intersection: Standing water flooding of intersection due to piping in intersection and capacity of receiving stream. DPW jetted / cleaned lines in intersection. DPW will video inspect drainage piping and evaluate pipe sizing.

DPW is currently in the process of confirming the size and geometry of the pipe configuration within the intersection and is scheduling to perform a video inspection of the piping system. DPW did replace catch basin tops in preparation of paving, however paving will be deferred until the fall of 2022 pending additional work to increase pipe size.

4. Carolina Road: Area of 65 & 75 Carolina Road experiencing flooding from water entering their property from the road. The garages are lower than the road, therefore water enter the basement. The problem is that there is a large amount of water runoff from the rear of the property located on the east side of Carolina Road that is bypassing storm drainage systems and overloading the City storm drainage which results in water exiting the roadway. DPW has cleaned and jetted the storm drainage system. The problem persist. Grading east of Carolina is difficult to access due to private fencing. DPW recommends a neighborhood meeting to obtain access to rear yards to evaluate grading/drainage. Potential capital improvement project required.

DPW rejetted/ cleaned the piping system coordination of a meeting with property owners to obtain additional information required.

5. Clark Avenue: Approximately 400 ft. north of Terryville Road (Route 72) water from private property (Ross Auto Parts) is eroding the embanking resulting in sediment & runoff entering Clark Avenue. DPW has notified the property owner and as of this writing the property owner has initiated corrective action. If the problem is not resolved, DPW will issue enforcements fines until corrective action is completed.

The property owner substantially complete with repairs.

6. Balsam Road: DPW has been contacted by property owner indicated that the City storm drainage is clogged. DPW cleaned and jetting the drainage system, however the property owner indicates that the problem persists. DPW expanded the area of storm drainage cleaned to include the interconnection to Hemlock Street and Hemlock Street to Pine Street. In addition, WPC is scheduled to assist DPW with videoing the storm line to confirm that there is no blockage.



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DPW performed a video inspection of the piping system and cleared roots within the downgradient drainage piping. The system is currently operating satisfactorily.

7. Hardwick Road: Area of ponding flooding at the intersection of Hardwick Road and Meadowbrook Drive along with the rear of the properties located on the north side of Harwick Road. Both issues are related to the backup of the stream that flows toward Brook Street. DPW will jet & clean the storm drainage system, remove sediment from the Brook Street culvert and inspect the stream for blockages that flows from Brook Street to the Coppermine Brook north of Artisan Street.

DPW jetted the storm drainage system and performed an inspection of the stream. Based on the inspection several areas of debris were identified and the property owners are being notified to clean/ remove the material.

8. Louisiana Avenue: The area of Louisiana Avenue at the intersection with John Avenue experienced standing water. The bridge did not overtop. The ponding is a result of City storm drainage at the John Avenue intersection backing up when the water surface of the Coppermine Brook rises and submerges the City outfall. The issue is not pipe capacity of the City's system it is function of the low elevation of the Louisiana Avenue & John Avenue intersection. Correction would require raising the elevation of the intersection that is not practical due to the impact to private property. It should be noted that the City storm drain on the east side of the bridge is also submerged, however the area does not flood due to the higher elevation of the area and storm drain catch basin grates. Louisiana Avenue storm drains have been replaced and the road is scheduled to be paved this September.

DPW jetted/ cleaned the storm drainage piping. Due to the catch basin top elevation water will continue to pond within the referenced intersection during large/heavy storm events when the water surface elevation of the Coppermine Brook is at the bottom bridge cord.

9. Trout Brook Road/ Sheffield Road: The intersection of Sheffield Road and Trout Brook Road floods due to the high water surface elevation of the Coppermine Brook. City storm drainage currently discharges directly into the Coppermine Brook and backs up with the Coppermine Brook floods. The City storm drainage previously discharged into a drainage channel that runs in the rear of Trout Brook Road property. The referenced channel has not



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been maintained by DPW, however DPW will contact property owner to arrange to clear the channel to provide a degree of storage.

DPW has inspected the existing drainage channel and will be contact the property owners request DPW access to clean/ clear channel. Due to wet weather conditions work will be completed in July/August. .

10. Frederick Street Bridge: The area initially flooded during tropical storm Ida due to the Pequabuck River overtopping in the area between Andrew Street and the Frederick Bridge. The bridge did not overtop, the area west of the bridge is the low point of the roadway and experienced flooding. It has been reported by a property owner that the berm upstream of the bridge overtopped and flooded private property. DPW has provided regular maintenance of the area on the bridge to ensure flow during storm events. The existing debris will be removed along with the sediment under the bridge (Inland Wetland permit required to remove sediment). The property owner did request assistance from the City to pump water out from behind the berm. The City did perform a similar task approximately 16 year ago when the berm broke, however since the area is private property and the berm was not breached City resources where not deployed. A potential project to provide future assistance to the property owner would consist of installing a manually operated drain pipe across the berm that would enable the area to be drained without the use of a pump.

DPW removed sediment and debris from the area of the bridge. BPW authorization an access/easement required to install control valve to drain the area behind the berm.

11. 125 East Road: The property of 125 East Road is accessed via a driveway that crosses a large culvert. The downstream headwall of the culvert has failed and will continue to deteriorate. The approximate cost of replacement is \$80,000-110,000. DPW is coordinating with the City's Building Department, Corporation Counsel and ECD to provide assistance to the property owner, however to date the means to facilitate corrective action/assistance is unclear.

DPW has contacted NRCS of the referenced damaged and performed field inspections with both NRCS and a City consultant WMC Inc. The Department also included the project as part of the City grant request to NVCOG. Based on a review by NRCS it appears the culvert repair/replacement does not meet program requirements and funding is not



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available. DPW hired WMC Engineering to perform a preliminary evaluation and cost estimate (\$532,000 end wall replacement and \$750,000 - \$800,000 for full replacement).

In my professional experience I do not agree with the estimate and estimate full replacement for a single driveway will be \$460,000. However, the cost estimate should be based on utilizing public funds for the purpose of the report. Although the culvert is not the responsibility of the City DPW is currently pursuing grants to complete the project. In addition, permitting and design of the culvert is required (\$70,000 & approximately 9-12 months).

Based on the property owners interaction with NRCS it appears that he is under the understanding that NRCS will be replacing his culvert, however as indicated above it does not appear NRCS fund repairs. Once DPW receives official notification from NRCS we will advise the property owner so they can pursue other remedies.

12. George Street: In the rear of the properties in the area of 44 George Street a stone walled concrete bottom channel (approx. 5 ft. x 5 ft.) has/is failing. A garage constructed over the channel has been condemned. Repairs are required throughout the channel, therefore corrective repairs performed by a single property owner may not result in a long term sustained solution. Unrepaired upstream sections of the channel may result in water from above flowing behind downgradient channel section causing failure. A review of property records indicate no City easements in the area, the drainage channel in question is private. DPW has scheduled a meeting with a consultant engineer to review evaluate conceptual design solutions. Ultimately any long term solution will require work on multiple properties. Although it is important for DPW not to provide false expectations to residents by implying that the City will perform corrective action or fund work on private property, there is a potential role the City can provide by facilitating a resolution among the multiple property owners. DPW will continue to coordinate action with the Building Department and the City's Corporation Counsel.

DPW has contacted NRCS of the referenced damaged and performed field inspections with both NRCS and a City consultant WMC Inc. The Department also included the project as part of the City grant request to NVCOG. Based on a review by NRCS it appears the drainage channel repair/replacement does not meet program requirements and funding is not available. Please see attached WMC letter regarding site conditions and estimated cost (\$1,900,000). In addition, DPW scheduled to procure the services of a survey to indicate



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property lines / channel location and confirm that there are no City easements associated with the culvert. The estimate cost to perform a survey is \$8,500.

13. Litchfield road: The road was paved in 2020 and as a result multiply driveway were impacted (lost driveway lip). Water runoff from the City road is entering driveways. DPW has replaced three driveway aprons. The driveway apron at 44 Litchfield Road requires additional work that will be performed the week of September 12. In order to prevent runoff into the referred driveway DPW has provided sandbags. The driveway at 33 Litchfield Rd is also receiving runoff. Due to the low slope (flatness) of the existing driveway the enter driveway is being replaced to obtain positive flow (\$2,200).

Driveway at 33 Litchfield Road has been paved to eliminate roadway runoff from entering driveway. Storm drainage is proposed at 44 Litchfield Road.

14. Divinity Street: The culvert located east of Peck Lane overtopped and eroded the downstream property (316 Divinity Street). The culvert is currently in the design phase of a project to replace the culvert. The erosion occurred on private property and is not the type of repairs performed by DPW. The property owner has obtained an estimate of \$10,500 from the same contractor that performs City storm drainage work Tabacco & Sons. In order for DPW to proceed with the culvert replacement project an easement from the property owner on the impacted area is required, therefore consideration should be made to cover repair cost subject to acquisition of an drainage easement.

Property prepared. Easement to replace culvert (west side of roadway) procured. WSP completing culvert replacement design.

15. Broad Street/ Todd Street intersection: The area of the Broad Street / Todd Street intersection floods. The flooding occurs when City storm drainage backs up due to a high water surface elevation of the Pequabuck River. Since the catch basin grate elevations on Crowley Auto are lower than the Todd Street storm drainage water exist the City's system and flows into Crowley / Broad Street and the Pequabuck River (as water recedes).

DPW has contacted the property owners engineer to perform a site visit and determine potential measure to mitigate/reduce storm drainage flow from City storm drainage.



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16. King Street / Page Park Road & Bristol Eastern entrance: King Street is a State Road and is not maintained by the DPW, however flooding occurs due to the capacity of the downstream culvert and stream that crosses Bristol Eastern. DPW will inspect the stream from Bristol Eastern to Carpenter Ave/ Stonecrest Drive & West Washington for blockages, however the depth of the King Street roadway flooding can be reduced if the area on Bristol Eastern is excavated/lowered behind the sidewalk approximately 12 inches. Lower the grade behind the sidewalk will result in flooding of the adjacent athletic fields but is critical to maintaining vehicle passage along King Street. The roadway is currently unpassable and as the Route 6 closes due to flooding the closing of this section of King St effectively prevent a detour from Route 6 to route 72.

DPW has contacted BOE facility manager regrading/drainage onto Bristol Central High School. Concerns expressed associated with draining water to field.

17. Royal Drive / Chippanee Golf Course: Properties along the north side of Royal Drive receive runoff from Chippanee Golf Course (10 hole). Bristol IWC issued order to correct.

Chippanee Golf Course has performed corrective work including construction of berm along common property line with Royal Drive properties, however the IWC order remains open pending evaluation/determination by the IWC.

18. Chippenwood Lane / Chippanee Golf Course: The properties at the eastern end of Chippenwood Lane receive runoff from Chippanee Golf Course. The drainage channel that discharges from the 11th hole pond runs along the eastern properties of Chippenwood Lane properties. The drainage channel in area has silted in and appears to have insufficient capacity to convey flow to the north. As a result storm water jumps the channel and flows into the Chippenwood lane properties. The drainage channel is on Chipanee property and corrective action would appear to consist of removing sediments/ excavating channel to provide original capacity.

IWC issued an order to correct. Chippanee Golf Course has performed corrective work removed silt/sediment from drainage channel to improve capacity of channel, however the IWC order remains open pending evaluation/determination of the IWC.



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19. James Street: The culvert at the end of James Street was blocked during the August 19 storm by debris. The stream jumped the river embankment, crossed James Street flooded three James Street properties before the flow returned to the stream. DPW cleared the debris and cleaned the road. The culvert pipe section are metal corrugated and sections have failed. The property owner has made repairs. DPW will continue to monitor.

As indicated above the property owners has made repairs. No additional action required.

20. Stonecrest Drive: The area of Stonecrest Drive adjacent to Sheriden Woods flooded due to the capacity of the downstream channel. DPW Engineering will inspect the area from Stonecrest to West Washington for blockages and DPW Street Division is scheduled to remove sediment in the area of the culvert.

Culvert was cleaned/ cleared of sediment by DPW.

21. Lake Avenue Culvert: The property owner of 706 Lake Avenue contacted DPW indicating that the condition of culvert has resulted in damage to his property. Based on a preliminary evaluation the property of 706 Lake Ave is approx. 100 ft. upstream of the City culvert and it appears water will overtop the culvert prior to backing up on the subject property. However the property owner is experiencing extensive flooding. The stream located on the property of 706 Lake Ave has silted up in areas and water jumps the stream around a bend upgrade of the house. As a result it appears water from the stream flow between the house and the garage during large flows. The flow erodes portions of the subject property and appears to flow into Lake Avenue where it enters the City storm drainage system (does not cross Lake Ave). The stream is on private property and requires an Engineer to evaluate capacity and corrective action, however the property owner has stated that he does not have the financial means to take corrective action. In addition the potential damage to the private property there is also a potential of damage to Lake Ave due to the redirected stream. DPW will be coordinating with the City's Building Department, Corporation Counsel and ECD to provide assistance to the property owner, however to date the means to facilitate corrective action/assistance is unclear.

Property owner has cleaned up property. DPW has performed an on-site inspection with NRCS, however the required stream restoration does not meet their program requirements. The site has also been evaluated by WMC Inc. See attached letter and estimated mitigation/ repair measures (\$350,000).



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Based on the condition of the culvert DPW preparing application for the State's Local Bridge program to replace culvert.

22. DPW landfill: An area of DPW's landfill along the northern section adjacent to Covanta eroded during the 9/2/21 storm. A section of the liner is exposed. A project to repair the erosion in areas throughout the landfill is currently being designed by the engineering firm of Fuss and O'Neil Inc.

Repairs included as part of the Departments FEMA assistance request and NVCOG grant request for funding \$50,000. The design associated with the repairs are currently being designed as part of a larger erosion project totaling \$600,000.

23. Glenn Street: The southern gutter of Glenn Street was eroded. DPW will be repairing the roadway (filling with surge stone), however additional investigation is required to control up gradient water flow. The water eroding Glenn Street is bypassing the stream that discharges to 706 Lake Ave.

DPW repaired roadway erosion.

24. Battle Street: Multiple properties on Battle Street south of Hill Street access their property via drainage culverts. The culverts are private. A number of the culverts eroded during the 9/2/21 storm. It appears that property owners are making repairs and DPW has not been contacted regarding this issue.

Property owners performing repairs. Notified of potential FEMA IA assistance.

25. Minor St: The gravel portion of Minor Street adjacent to Richie's ice cream eroded along the northern gutter line. DPW is regrading the road and is scheduled to pave the roadway section with funding obtained from the solar farm.

DPW repaired gravel roadway. Bituminous paving of roadway pending.

26. 595 King Street: The referenced property is receiving runoff from Page Park. There is an up gradient drainage channel that run along the western property lines of the Marilyn Drive houses and crosses the old ski slope. The flow through the swale was shorts circuiting and



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a portion of the runoff flows towards the property of 595 King Street. Based on an on-site meeting, the Park Department will perform repairs to the existing swale/piping system to facilitate diversion of runoff across the old sky slope. However, the northern end of Marilyn Drive and the down gradient area between the swale and the 595 King Street will flow to the property. The option of installing an addition diversion channel closer to the King St property does not appear viable due to the grade south of play scape, need to remove trees and the need to direct additional water to the State's drainage system. One potential option is to fill the existing swale that directs flow to 595 King Street, however that would require work within an existing tree area that will limit use of equipment

Repairs completed by Park Department contractor.

27. Jerome Avenue: The home at 396 Jerome Avenue (in floodplain) immediately south of Willow Brook Road experiences regular flooding into structure. The City is investigating options to assist the homeowner.

Stream located in rear northeast portion of property. Funding available through NRCS to purchase property to create open space. NRCS program requires no funding fom the City, however it does require City to aquire property as open space.

28. Hopmeadow Road: 199 Hopmeadow Road experienced rising stream waters. DPW will investigate downstream culvert condition for maintenance.

Stream/drainage channel in question is private (not City of Bappears to be located on un-accepted portion of Neuman Place (east of Mano Lane). Additional investigation required.

29. Perkins Street: Property owners at 135 Perkins Street and 120 Perkins Street (west and east of the street culvert) complained about excessive water, high stream velocities and erosion. The City has inspected the properties and culvert, as well as the upstream pond system.

Erosion a result of large storm events, the culvert did not overflow water was retained within the pipe section. No additional storm drainage has been added/connected to culvert.

30. Sonstrom Road: The property owner at 280 Sonstrom Road indicated there was flooding in the rear lot. A private system traversing the neighbor's rear lot to the City's catch basin has not been maintained. The City's storm drain system appears to be draining properly.



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DPW install a catch basin upgrade of the driveway in question.

As previously indicated to the BPW DPW resources are allocated to maximize public benefit. Therefore, flooding is addressed along the following priorities:

1. Flooding of public infrastructure/roadways entering private property (homes/buildings)
2. Flooding of public infrastructure/roadways entering private property
3. Flooding of private property entering/impacting public infrastructure/roadways
4. Flooding of private property impacting multiply private properties
5. Flooding of private property impacting single property

Please feel free to contact me with any question at 860-584-6113.