PROPOSAL TO PROVIDE

Project Scoping of Flood Mitigation Efforts for Dry Run Creek

Photos courtesy of City of Oelwein Facebook Page

Prepared for:
City of Oelwein, IA
March 1, 2023

MSA

March 1, 2023

Dylan Mulfinger
City of Oelwein
20 2nd Avenue SW
Oelwein, IA 50662

Re: Proposal for Project Scoping of Flood Mitigation Efforts for Dry Run Creek

Dear Dylan,

MSA Professional Services, Inc. (MSA) appreciates the opportunity to describe our qualifications and present this proposal. We are confident that we have the proper experience and understand your project needs. We have obtained the studies completed by IDNR and their consultant, have reviewed the modeling and GIS data included with the study, and feel that we can hit the ground running on this important project!

On MSA's water resources team, we are very passionate about our chosen profession; we are committed to providing excellent service to you and hope to do for you what we enjoy most: working to integrate natural systems into our built environment for future generations. Please carefully consider our experience as summarized in this proposal. We hope that through our past successes and the information provided in this document, we will gain your confidence in our understanding of floodplain studies, our ability to deliver a superior product, and our genuine passion for our work.

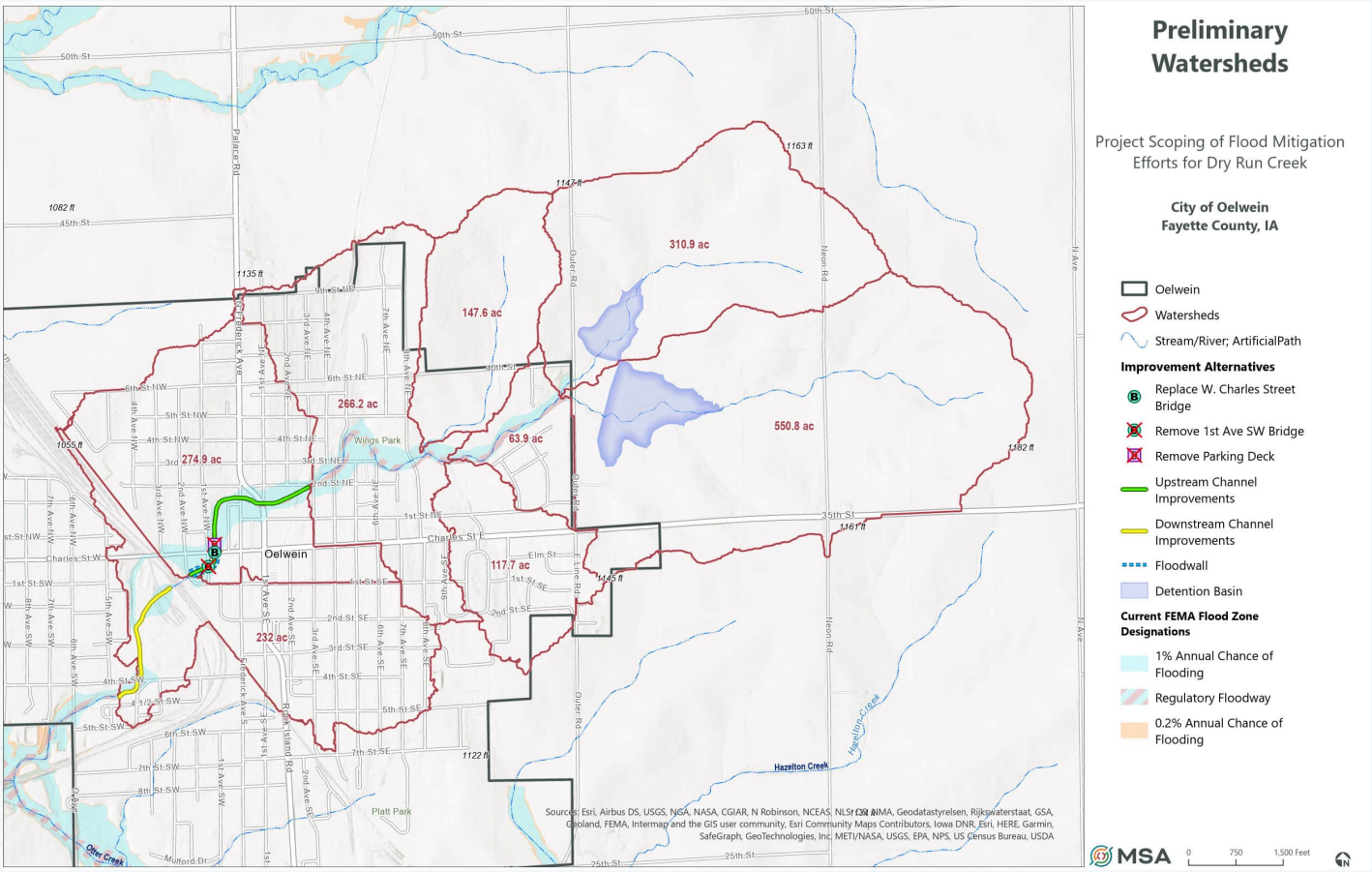
We look forward to continuing our relationship with the City and discussing this project further. As always, if any questions arise during review of this proposal or additional information is desired, please contact me at (608) 242-7779 or ethompson@msa-ps.com.

Sincerely,
MSA Professional Services, Inc.

Eric Thompson, PE
Project Manager

PROJECT UNDERSTANDING

Dry Run Creek is a highly urbanized stream that flows through the northeast quadrant of the City of Oelwein. Baseflows in the stream are comparatively low; however the stream is subject to flash flooding. Estimated 100-year flow rates in the stream are over 3,000 cfs at the stream's confluence with Otter Creek. At these flows, every culvert and bridge crossing along the creek is expected to overtop. Not surprisingly, there are systemic flood conditions along its entire length. A 2021 report commissioned by the Iowa DNR included photos documenting extensive flooding along the creek for every year since 2016.



As part of the 2021 study, various hydrologic and hydraulic model simulations were completed to evaluate the effectiveness of different flood control alternatives along the creek. In total, 11 different alternative elements were evaluated in 11 different combined packages. The report found three of the combined alternative packages to have potential to achieve substantial flood reduction potential.

Alternatives evaluated included the following:

1. Increasing the size of the railroad culvert
2. Removal of 1st Avenue SW bridge
3. Removal of parking deck north of W. Charles Street
4. Replacement of the W. Charles Street bridge
5. Storage in Wings Park
6. Storage upstream in watershed (outside the City limits)
7. Channel improvements – Reach 1
8. Channel improvements – Reach 2
9. Channel improvements – Reach 3
10. Addition of flood wall on south bank of Dry Run Creek immediately upstream of the railroad
11. Addition of flood wall on north bank of Dry Run Creek immediately upstream of the railroad

SUMMARY OF ALTERNATIVES PACKAGES

Potential Alternative Improvement		Combined Alternatives Scenario										
		1	2	3	4	5	6	7	8	9	10	11
A	Increased railroad culvert size	X										
B	Removal of 1st Avenue SW Bridge		X	X	X	X	X	X	X	X	X	X
C	Removal of parking deck north of W. Charles Street		X	X	X	X	X	X	X	X	X	X
D	Reconfiguration & replacement of W. Charles Street Bridge		X	X	X	X	X	X	X	X	X	X
E	Storage in Wings Park			X								
F	Storage reservoirs upstream of Outer Road				X		X	X	X	X	X	
G	Lined rectangular channel, upstream of railroad					X	X					
H	Deepened & lined rectangular channel, upstream of railroad							X	X	X	X	X
I	Deepened & lined trapezoid channel, downstream of railroad									X	X	X
J	Small flood wall on left side of channel upstream of railroad								X			
K	Small flood wall on right side of channel upstream of railroad								X		X	
	Recommended:	N	N	N	~	N	~	~	Y	Y	Y	N

The City has issued a request for proposals to identify an engineering firm that will develop a plan building off alternatives previously studied that will provide cost-effective flood relief for the residents and business owners in the City of Oelwein. Of particular concern is making sure that the fire station be made fully accessible during storm events that would currently cause flooding, rendering vehicular access to/from the fire station difficult, if not also dangerous.

We understand the necessary effort to include the following primary tasks:

- Determine technical feasibility of alternatives previously identified as having high potential for cost-effective flood reduction.
- Prepare conceptual-level engineering drawings and construction cost estimates for alternatives deemed feasible.
- Determine potential flood benefit in terms of reduced (eliminated) 100-year flood risk to existing buildings and access to critical public services (e.g. fire station) and estimate the value of properties protected from flooding.
- Complete FEMA Benefit-Cost Analysis.
- Assist the City in identifying funding sources and preparing capital planning documents.

SCOPE OF WORK

ENGINEERING ANALYSIS TASKS

The following work tasks have been re-organized to better fit what MSA feels to be a linear project development schedule. Except where specifically noted, this scope of work is inclusive of all tasks identified in the City's request for proposals.

1. **Existing Conditions Detailed Mapping.** Using the hydrologic and hydraulic models provided by the City, MSA will evaluate estimated flood elevations and extents along Dry Run Creek for the 10-, 25-, 50-, and 100-year events. Using available aerial photographs and LiDAR data, MSA will document the intervals at which floodwaters reach and/or inundate buildings by 1 foot or more (alternatively, and at the direction of the City, MSA can evaluate flood risk at inundation levels less than 1 foot; for recent studies, MSA has used 6 inches).

2. **Existing Conditions Flood Risk Summary.** MSA will create a tabular database of buildings, likely by parcel, listing approximate low parcel grade, approximate lowest grade adjacent to any building (estimated inundation level) and flood elevations for the 10-, 25-, 50-, and 100-year events. Buildings subject to flood risk as defined in Step 1 will be identified according to the highest frequency of inundation.

   MSA will work with City staff to estimate the approximate value of each building identified as being subject to flood risk. Additionally, MSA will identify critical vehicular routes subject to flooding.

3. **Meetings.**
   - *Staff Meetings* – MSA will attend three (3) staff meetings during the course of the project. The first meeting will be held at project kick-off to introduce project staff, discuss the project scope and timeline, and to exchange technical data. The second meeting will be held after MSA has revised existing modeling and has developed

existing conditions inundation maps and flood elevation data for purposes of understanding the scope and setting the stage for the stakeholder meeting. The final meeting will be to present the performance of the optimized alternatives scenarios, to discuss anticipated flood reduction benefits, and to discuss estimated project costs. For purposes of establishing project costs, it is assumed that the meetings will be hybrid in-person/ virtual meetings, will involve no more than three (3) MSA staff (at least one in person) and each meeting will last no longer than one (1) hour.

- *Stakeholder Meeting* - MSA will attend a meeting hosted and scheduled by the City to discuss the project with identified stakeholders. For purposes of establishing project costs, it is assumed that the meeting will be in person, no more than three (3) MSA staff will attend the meeting and the meeting will last no longer than two (2) hours.

4. A**lternatives Optimization**. MSA will revise the three alternatives scenarios recommended in the 2021 flood study and will conduct a performance sensitivity analysis on various design components. Specifically, MSA will evaluate the following:
   - *Required storage volume in upstream reservoirs.* MSA will evaluate how much storage is required to reduce peak flows entering the City for various events. Two things of particular importance that will be evaluated are the estimated flow reduction(s) that can be achieved by reservoirs that have a size just small enough to not be regulated dams, and the approximate cost of construction of reservoirs (including land acquisition) relative to the amount of peak flow reduction that can be achieved.
   - *Bridge/Culvert Capacity.* MSA will evaluate the effects of various sized replacement structures on the anticipated flood reduction achieved in the creek.

5. **Improved Conditions Detailed Mapping.** After performing the previously described optimization analyses, MSA will resolve the hydrologic and hydraulic models for the three recommended alternatives scenarios and will redetermine flood elevations and inundation areas along Dry Run Creek. This information will be used to identify existing buildings currently subject flooding that would be removed from the floodplain under each improved scenario for each of the respective flood events.

6. **Improved Conditions Flood Risk Summary.** The value of buildings removed from the floodplain will be tabulated for each of the three scenarios.

7. **Concept Designs, Construction Cost Estimates, and Benefit Cost Analysis.** MSA will prepare conceptual design plans for each selected alternative for purposes of developing a preliminary construction quantities list. The quantities list will be used to prepared estimated construction costs for each alternative element including land acquisition, engineering design, permitting, land acquisition and contingency. Alternative costs will be compared to anticipated flood reduction benefits using FEMA's BCA toolkit.

8. **Prepare Report.** MSA will prepare a technical report that documents the analysis completed in the previously described scope of work.

DELIVERABLES:

- **Engineering Analysis Report**
  - MSA will prepare a technical report that documents the analysis completed in the previously described scope of work. At a minimum, this will include:
  - Documentation of design goals and study methods.
  - A description of the scope and extent of each of the three alternatives analyses included in the study.
  - A description of the evaluation of the optimization of each alternative element (specifically upstream storage volume and bridge/culvert capacity increases).
  - As provided by the City, a summary and enumeration of past damages and risk(s) to people, structures or infrastructure that the planned mitigation activity is designed to avoid in the future.
  - Conceptual engineering design drawings for selected alternative components.
  - A list of quantities and conceptual engineer's estimate for construction including land acquisition, engineering design, permitting, land acquisition and contingency.
  - A Benefit Cost Analysis for each complete alternative using FEMA's BCA Toolkit 6.0.

The City's RFP identified various other deliverables including the following:

- Biological evaluation, property, or cultural resource assessments;
- Phase 1 and 2 Environmental Site Assessment for hazardous materials presence or contamination, soil borings;
- Archeological Phase 1 services, permit acquisition as needed;
- Other testing, monitoring, modeling, or subconsultant type of work.

It is impossible prior to the conceptual design of alternatives to estimate the level of effort that would be required to conduct any of these activities in the field, and so the items within the previous bullet list are not specifically included in MSA's proposed scope of

work. To the level that these activities may be completed remotely using published online resources to determine whether there are critical non-engineering related issues that would affect the feasibility of any option, MSA has included an allocation of labor hours in our estimated project budget.

MSA's anticipated budget is itemized in the following section. A large percentage of estimated costs are predicated upon an assumed level of detail applied to the various modeling and design-optimization tasks. MSA's activities regarding these aspects of the project will be limited according to the judgement of MSA's project manager to fit the allocated cost for each task.

PROJECT BUDGET

	ESTIMATED HOURS	ESTIMATED $/HR	TOTAL ESTIMATE
Engineering for Engineering Analysis Report	455	$163.60	$74,438
Benefit Cost Analysis	36	$173.33	$6,240
Environmental and Other Assessments	116	$162.76	$18,880
		GRAND TOTAL:	**$99,558**

FEMA Grant Experience

MSA has extensive past experience working directly with the Federal Emergency Management Agency (FEMA) to facilitate and maximize FEMA Public Assistance funding for communities struck by natural disasters. In addition to FEMA funding, MSA has assisted affected communities in applying for and managing Community Development Block Grants – Emergency Assistance Program (CDBG-EAP) Funding and Natural Resource Conservation Service (NRCS)/U.S. Department of Agriculture (USDA) Emergency Funding.

MSA's experience with FEMA is a distinct advantage of a firm our size specializing in small communities. We know small communities are limited in the number of staff to dedicate to an endeavor of this magnitude. We also know MSA must act as a partner and provide daily assistance and coordination to work through the FEMA process.

PARTIAL LISTING OF FEMA GRANT EXPERIENCE

FEMA HMGP - $7,260,907.91

Acquisition/Demolition of Flood-Prone Properties

Community	Grant Amount
Sumner, IA	$3,165,267.60
La Valle, WI	$2,333,949.45
Elroy, WI	$1,293,344.49
Kendall, WI	$468,346.37

FEMA PDM – Now BRIC

Advanced Assistance Stormwater Analysis and Planning

Community	Grant Amount
La Valle, WI	$103,260.00

FEMA Public Assistance

Derecho

Community	Grant Amount
Ely, IA	$193, 567.10
Hiawatha, IA	$911,979.93
Atkins, IA	Admin Assistance Only
Fremont, IA	Admin Assistance Only

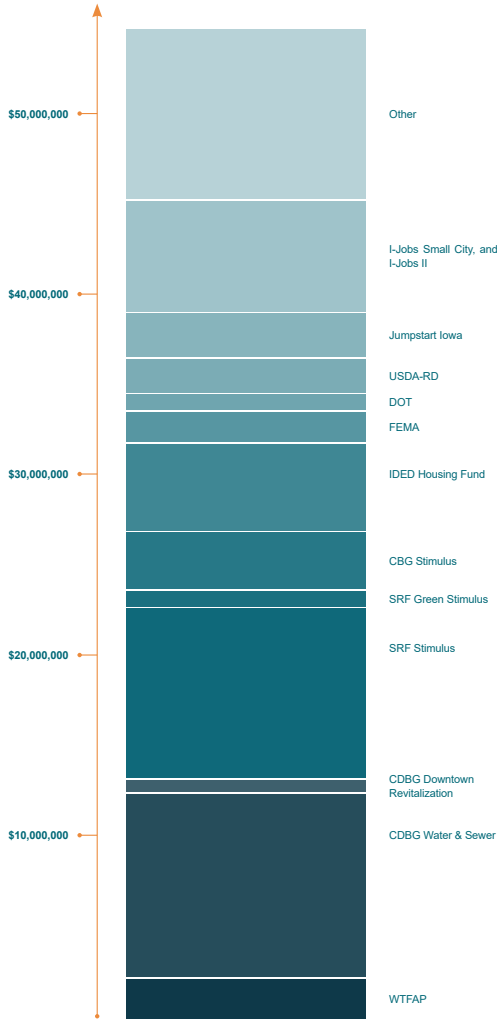
Flooding

Community	Grant Amount
La Valle, WI	$511,140.46

MSA

IOWA GRANT FUNDING SUCCESS

$59,000,000 AND COUNTING!



MSA'S FUNDING SERVICES

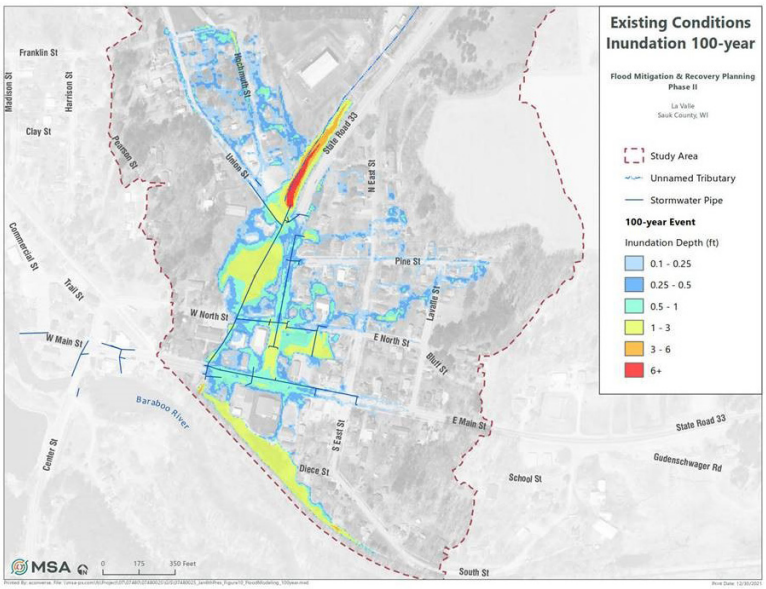
We turn every stone in order to find both public and private sources to help you fund your project. We know the ins and outs of a wide variety of programs to help you maximize funding sources, manage timelines, and take care of the details to satisfy the fund requirements. With MSA's support, you can complete the projects you must, and deliver more of the projects you want, all while getting closer to the balanced, sustainable community you've always envisioned.

Project Experience

FEMA MITIGATION ASSISTANCE

LA VALLE, WI

The Village of La Valle, located on the Baraboo River, has sustained significant damage in several presidentially declared flooding disasters over the years, including in 2007, 2008 and 2018. In 2018, the river's levels crested at just over 22 feet, readily surpassing the community's moderate flood stage level of 17 feet and major flood stage mark of 19 feet. Many residential, commercial and village-owned properties and infrastructure were adversely impacted by each of these declarations. As a result, the Village has been diligently working to mitigate future impacts from flooding.



The Village's most recent focus is to acquire and demolish substantially damaged properties, with 23 property owners already applying for assistance since the 2018 flooding disaster. This aggressive buyout project is reflective of the community's desire to take positive, purposeful strides toward revitalizing affected neighborhoods and businesses. In support of the project, the Village created a Revitalization Committee and is partnering with several area agencies including the Sauk County Development Corporation, Sauk County Emergency Management and the University of Wisconsin-Extension to maximize efforts. Since the 2018 flood, the Village has struggled to financially balance flood-related repairs and needs. While it received some initial relief through FEMA, the community also needed to raise taxes, borrow funds and drain existing accounts to meet obligations and continue to make progress. The impacts have also been detrimental to businesses, with some proprietors closing up shop and others choosing to relocate outside of the floodway, which in some cases, means leaving La Valle entirely.

In 2020, MSA assisted the Village with the compilation of a scope, cost estimate, schedule and application for a FEMA FFY19 Pre-Disaster Mitigation Grant in collaboration with Wisconsin Emergency Management. La Valle was successful in being awarded a $106,260 Advance Assistance Grant through the program and was the only community in Wisconsin to receive this award in 2020; all other awards went to counties of the state for hazard mitigation planning efforts.

These funds are being used for a Recovery Plan which will model the floodplain to determine flood damage flow rates and elevations for the Baraboo River and determine peak runoff rates and volumes from upland flooding sources. After documenting current issues, several alternatives will be explored to address flooding due to these two sources. One alternative that will be explored is the potential relocation of Village assets outside of the floodplain and flood fringe. To envision what this might look like, MSA partnered with UW-Extension to hold a two-day design charrette with the Village. Advance Assistance grant funds will be applied to mitigation efforts and also used to update the Village's Comprehensive Plan and incorporate recommendations from the Recovery Plan. The funds will also support review and updating of the Village's ordinances to ensure zoning and building codes align with mitigation efforts, and ensure compliance with DNR's model floodplain ordinance and the National Floodplain Insurance Program.

In June 2021, the community received notice of receiving over $1 million in grant funding through the FEMA Hazard Mitigation Grant Program to assist with the demotion of five flood-prone properties along the Baraboo River, reducing La Valle's vulnerability to future flooding events. The village has plans to transform the former properties into open public green space and is making great progress toward community resiliency and revitalization in the face of tremendous challenges.

Project Experience

FLOOD REDUCTION PROJECT

LAMONT, IA

The City of Lamont has suffered numerous flood events in its history – floods occurred early in 2014 as well as in May 2013, July 2010 and May 2008. Flooding in the City comes from two main sources: Lamont Creek (watershed area of 8.4 square miles) and a tributary to Lamont Creek and an associated unnamed drainageway along an old railroad bed (combined watershed area of 3.8 square miles). MSA conducted a study in 2013 which determined what level of flooding would likely cause damage to homes and other buildings (termed a "damage event") and provided conceptual solutions for reducing flooding to levels below these damage events.

Flooding from Lamont Creek was shown to cause damage during floods more frequent than the five-year flood. Several watershed-level management solutions were proposed by the study, ranging from the construction of several 10- to 20-acre ponds throughout the watershed (to reduce flood flows by 20% and therefore reduce the incidence of damage to five-year frequency) all the way up to a concept for a 300-acre wetland restoration (to reduce flood flows by 75% and therefore reduce the incidence of damage to 100-year frequency). Some stream capacity improvements were also conceptualized – most significantly the idea of removing bridges that are an obstruction to flooding.

Flooding from the tributary was also shown to cause damage during floods more frequent than the five-year flood; however, the study clearly identified the Henderson Street road crossing as a significant obstruction to creek flows and suggested a new bridge structure and some channel improvements that would alleviate flood damage incidence up to 100-year frequency. In the same vicinity, there is a drainageway parallel to an old railroad bed which contains several detention-basin areas. The study determined that while conveyance and storage capacity was generally adequate, the basin outlets were susceptible to blockage from debris and lacked suitable 'emergency' flow paths. Therefore, debris-protection measures and a modification of road profiles (which blocked emergency flow routes) were suggested.

LEVEE REPAIR

CASCADE, IA

In March 2013, the City of Cascade received a letter from the Rock Island District of the U.S. Army Corps of Engineers (COE) declaring the condition of the City's levee to be unacceptable as defined by Public Law (PL) 84-99. Unless the levee is returned to an acceptable condition, the City is ineligible for an 80% Federal cost-share for rehabilitation of the levee, should it be damaged by a flood event.

MSA conducted an inspection of the levee and confirmed that the condition of a pair of culverts that allowed runoff to pass through during low-flow conditions was very poor. We then conducted a topographic survey and developed plans to repair the culverts.

Repair plans and methods needed to accommodate the possibility of flooding occurring during construction activities. MSA required the contractor to close the gap in the levee any time crews were not on site and incorporate suitable temporary erosion control practices to protect the waterward side of the levee, should flooding occur while the levee was temporarily closed.

Additionally, MSA's design incorporated two features to improve operability of the levee. The most important was the inclusion of a portable pump access ramp to improve the ease and safety of deploying a trailer-mounted pump system, used to drain water trapped behind the during high flow conditions.

Project Experience

FLOOD MITIGATION PLANNING AND DESIGN

ELKADER, IA

Like many other Iowa communities, the City of Elkader sustained damage from severe flooding in 2008. Since that time, the City has bought out flooded properties and assessed an existing levee. The City hired MSA as a first step to protecting the community from similar, future flooding. MSA began by investigating the feasibility of several mitigation alternatives, which included improving the levee, constructing a floodwall and improving the channel.

MSA developed new flood frequency estimates for the river – the existing estimates were approximately 30 years old. Additionally, MSA improved the hydraulic model with additional survey data and LiDAR flight data. This provided assurance that the most current information was being used in the assessment of possible mitigation strategies.

Our team considered nine mitigation alternatives, including levees, floodwalls, stream channelization, hydraulic improvements to a downstream bridge, and modifications to an existing dam in the community. We took into consideration how many homes and businesses would be protected by each mitigation alternative.

MSA also checked floodway impacts to make sure that an improved situation for some people would not come at the expense of others. Ultimately, our team determined that constructing a floodwall and improving the existing levee could protect downtown structures, without violating FEMA or Iowa rules regarding flood elevation impacts.

MSA determined that the City needed to replace two stone retaining walls along the river and incorporate new retaining walls at two lift stations to raise them above the floodplain. Each condition was unique, necessitating three different types of walls: cantilevered concrete, restrained concrete, and partially restrained steel sheet piling. Various funding sources required that each project be bid separately.

MSA coordinated the project design with the Army Corps of Engineers and Iowa DNR to secure permit authorizations prior to starting construction.

Project Experience

FLOOD CONTROL BASINS

SUMNER, IA

The City of Sumner in Bremer County, Iowa, has experienced multiple flood events over the past several years. In 2018, the City hired MSA to complete a comprehensive study of one of the major watersheds draining the City and to design a stormwater management system to protect downstream areas of the City from 100-year flooding. MSA's study of the system identified that most of the flows originate from two primary subwatersheds: a northern watershed confined to a narrow valley and an eastern watershed that collected runoff in a wider, flatter expanse.

MSA's design of the proposed solution worked with the natural topography of the northeast quadrant of the City to create three separate detention basins. Stormwater from an approximately 263.5-acre watershed is captured by the stormwater detention system. The three basins combined cover approximately 17 acres and provide approximately 95 acre-feet of storage. The basins were constructed in 2020.

A temporary connection allows the detention basis system to slowly drain into an existing 30" storm sewer that runs under Walnut Street. Design has been completed on permanent discharge from the three-cell stormwater detention basin system using a combination of drainage ditches and box culverts to convey stormwater to the Little Wapsipinicon River and MSA is currently assisting the City in acquiring funding to complete the final phase of the project.

LEVEE DESIGN

KEITHSURG, IL

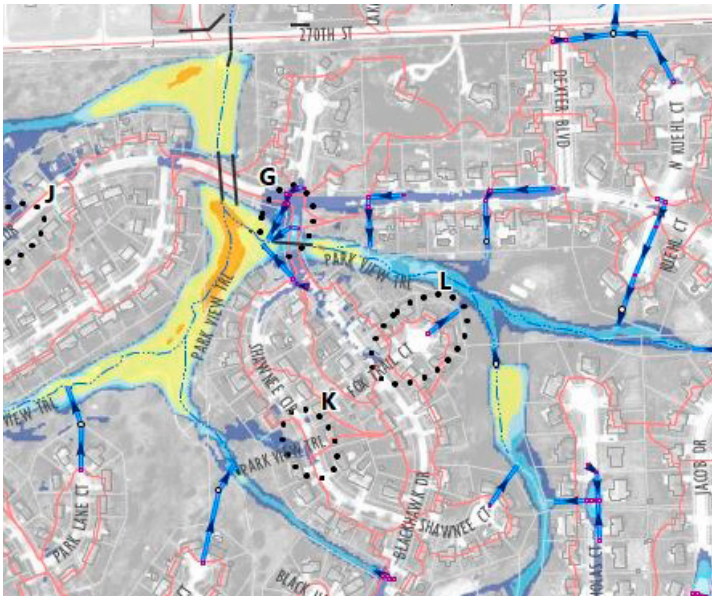
The City of Keithsburg, located along the Mississippi River at the confluence with Pope Creek, wanted to make improvements to its flood protection system. These improvements primarily involved raising the levee, but also included construction of floodgates at road crossings and improvements to interior drainage. These improvements all required review and approval by state and federal permitting agencies.

Project Experience

PARKVIEW STORMWATER DRAINAGE SYSTEM ANALYSIS

SCOTT COUNTY, IA

MSA conducted a drainage and flood reduction study for a 480-acre unincorporated portion of Scott County known as Park View. Development within Park View is predominantly residential and has been ongoing for approximately 50 years, with engineering historically being completed by the land developers. Once constructed, the system of roads and the stormwater management systems serving those roads become the responsibility of the Scott County Secondary Roads Department and the department had concerns about whether the existing drainage system meets current service level goals.

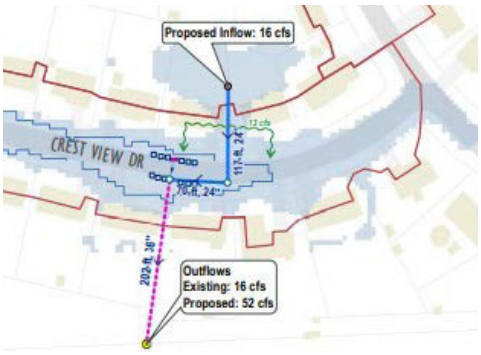


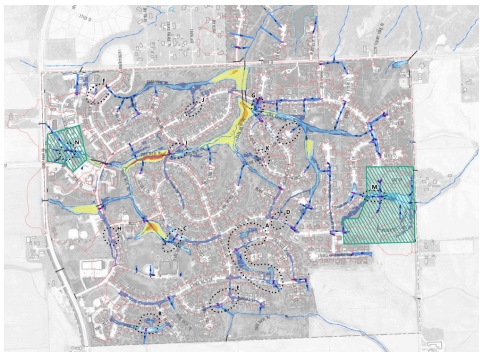
MSA conducted a thorough study of the area, beginning with a complete survey of all publicly owned storm sewers and culverts including visual inspection of the entire system and storm sewer televising. Information collected in the field investigation was coded into a GIS database for delivery to the County as a final product, but also for MSA in the development of a detailed hydrologic and hydraulic model of the whole Park View area. MSA completed the study using XP-SWMM 2D which provided significant insight into drainage and flooding conditions within the study area.

The intent of the modeling was to determine the ability of the existing stormwater management system to collect and convey 5-year peak flows (Iowa SUDAS standard) from City streets so that adequate safe passage of vehicles could be maintained during 'minor' storm events while also preventing flooding of existing structures during the 100-year storm (a major event). Specifically, this entailed determining whether the combination of pipe capacity and the ability of the street itself to convey flows was adequate to contain 100-year flooding within the public rights of way.

MSA's modeling indicated that there were six locations (generally describing larger elements of the drainage system, as opposed to a single discrete point) where, under 5-year conditions, there was excess flow in the street. In nearly all instances, the presence of excess flow was due either to the comparatively limited extent of the existing storm sewer system or the accumulation of surface flows from upstream areas that overwhelmed the capacity of downstream systems. Under 100-year conditions, there were a total of twelve locations where drainage criteria were not met.

These twelve locations were entirely inclusive of areas identified as problems under 5-year conditions. Each of these problem areas were studied to determine what systemic improvements would be required to achieve design standards. While stormwater detention was evaluated as a possible solution, because flooding originated in densely developed areas and passed through other densely developed areas, there were no real detention options that could be realized without removal of existing home. As a result, solutions generally involved increases in overall system capacity.





Project Experience

WEST 32ND STREET STORMWATER DETENTION FACILITY

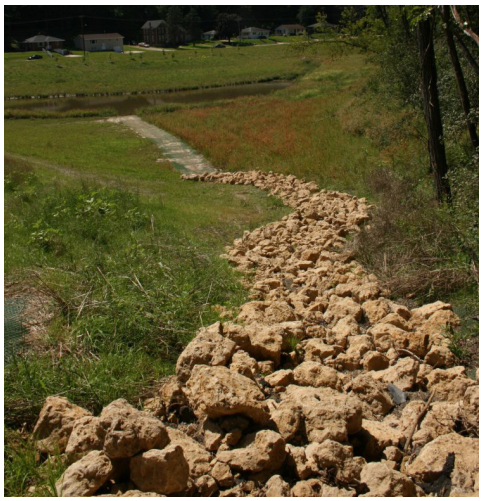
DUBUQUE, IA

Following the devastating floods of the 1990s, the City of Dubuque authorized a comprehensive study to plan systemic improvements to their stormwater management system to address the widespread flooding they experienced. The resulting [Bee Branch] Drainage Basin Master Plan was prepared in 2001 and recommended three projects to eliminate risk from flood damage in the watershed, one of which was the West 32nd Street Detention Basin. The City hired MSA to prepare detailed design and construction plans for this 90-acre-foot stormwater detention facility to serve approximately 1,200 acres of Dubuque. It was necessary that our design be integrated with improvements for other phases of the project being designed by other consultants.

MSA's initial investigation found that the design proposed by the drainage basin master plan was not achievable as originally conceived; to achieve the desired storage volume, an extremely tall dam structure would have been required which would have necessitated the closure of West 32nd Street - the major traffic corridor for the area. MSA's proposal was based on an innovative approach to construct two smaller dams in series that maximized storage within the valley while minimizing the amount of excavation necessary to construct the facility. A side benefit of this configuration was that the structure received only a moderate hazard classification.

MSA's design included landscape architecture which served to make the basin as attractive as it is functional. The basin covers approximately 15 acres and includes islands, peninsulas, and a meandering baseflow channel, with native vegetation throughout the area. Our design also included added-benefit features including 2.0-acre wet detention cell that can capture approximately five years of sediment load from the upstream watershed. The City can drain the basin and dewater the sediment prior to excavation. The basin will refill with water, hiding the evidence of the maintenance activities. Upon completion, the City was so impressed with the appearance of MSA's design that we were awarded another contract to add pedestrian trails, park benches and interpretive signs along the perimeter of the facility.

The project was finished in 2010 at a total construction cost of $2.1 million. MSA and the City of Dubuque received the Iowa ACEC Chapter 2010 Honor Award for Engineering Excellence in the Special Projects category for this project.



IT'S MORE THAN A PROJECT. IT'S A COMMITMENT.

PROJECT SCOPING OF FLOOD MITIGATION EFFORTS FOR DRY RUN CREEK
OELWEIN, IA | MARCH 1, 2023

MSA

www.msa-ps.com