

Flood Damage Reduction Minnesota River at Granite Falls, Minnesota



FLOOD DAMAGE REDUCTION MINNESOTA RIVER AT GRANITE FALLS, MINNESOTA

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I

Overview of Flood Reduction Efforts

SUMMARY OF FLOOD DAMAGE REDUCTION EFFORTS GRANITE FALLS, MINNESOTA

The City of Granite Falls is located on the banks of the Minnesota River in west central Minnesota. While the river represents a valuable resource to the community as represented by the parks and residences located along the river banks in addition to aesthetic, recreational and economic benefits derived by the city, its residents, and the surrounding communities, the Minnesota River has also taken its toll on residents during spring floods with associated economic and social impacts to the community.

The City of Granite Falls experienced two major floods within the last nine years. These floods include the 1997 flood of record and the 2001 flood. Both of these events resulted in a Presidential Disaster Declaration. The flood of record, which occurred in April of 1997, had a peak discharge of approximately 53,000 cubic feet per second. The distribution of these flows was estimated at 40,000 cubic feet per second in the main channel and 13,000 feet per second in the secondary channel. While a similar event occurred in the spring of 2001, with flood levels slightly less than the 1997 event, the magnitude of flows and impacts to the community were similar.

Both of these flood events required major flood fighting efforts consisting of hundreds of volunteers filling literally hundreds of thousands of sandbags. It was estimated that in the flood of 1997 in excess of 800,000 sandbags were filled as compared to approximately 620,000 in 2001. In addition to the hundreds of volunteers, the city also relied on contractors building temporary levees with construction literally on residential streets reaching a height in excess of 10'. Volunteers worked day and night adjacent to the Minnesota River flowing at dangerous levels with exceptionally fast velocities of 8' to 10' per second, approximately 12 to 15 miles per hour and at a water temperature just above freezing.

Many agencies were also involved in flood fighting efforts within Granite Falls, including the U.S. Army Corps of Engineers, Minnesota Department of Natural Resources, Minnesota National Guard, National Weather Service, U.S. Geological Service, Minnesota Department of Transportation, State, County and Local Officials.

In 1997, the city spent approximately \$1 million in flood fighting and clean-up efforts with approximately \$800,000 expended during the 2001 flood event. It is important to note that because of the temporary flood fighting efforts which took place in both 1997 and 2001, the city was able to prevent approximately \$3.1 million of potential damage from occurring to both commercial and residential properties during each of the flood events.

Shortly after the 1997 flood a Section 205 Flood Control Study report was prepared by the U.S. Army Corps of Engineers with the objective of determining the feasibility of developing a small flood control project in Granite Falls. Because the results of this study did not meet the Corps of Engineers' cost/benefit ratio, no permanent flood control projects were recommended.

Faced with the realization that future flood events would likely reoccur and the fact that it could become increasingly difficult for the city to continue to rely on volunteers for temporary flood

fighting as well as state and federal agencies expending funds constructing temporary levees, the Granite Falls City Council, in order to solicit public input into future more permanent flood fighting measures, held a series of community meetings in 2001 where individuals owning both businesses and homes located in the flood impact areas were invited to attend and offer their input in helping to identify long-term flood mitigation projects. Absent any permanent small flood control projects approved through the Section 205 Flood Control Study, these meetings focused on the realization of acquisitions and relocations of both residential and commercial properties.

The City of Granite Falls realized that additional funding would be necessary in order to address long term permanent flood mitigation objectives. As various funding agencies look to whether or not a definite plan for approaching permanent flood mitigation projects was in place, in late fall of 2001 following a series of community meetings, the City Council at the urging of both the Department of Trade and Economic Development as well as the Minnesota Department of Natural Resources, through funds provided by both the DNR and FEMA, commissioned a Hazard Mitigation Study to be completed. The objective of this study was to identify, evaluate and prioritize public health, safety and property damage risks and to develop a plan for implementation of mitigation measures.

The study completed in January of 2002 was further updated in September of 2003 in that cost estimates associated with the various flood mitigation projects were revised. This plan also has become known as the Locally Preferred Plan and is now currently being used to lobby at both the state and federal levels for additional flood mitigation dollars to address the priorities identified in the study.

Since 1997 the City of Granite Falls has been concentrating on the top priorities identified in this study, namely the acquisition and relocation of residential and commercial properties from the flood impact areas and the restoration of those areas where commercial structures are removed. Through a combination of funds received from the 1997 flood event as well as additional funding provided by FEMA and the Minnesota Department of Natural Resources including a Small City Development Block Grant, the city obtained funding of approximately \$12 million with approximately \$9 million expended to date. The expenditures of these funds have resulted in the acquisition, demolition and relocation of 35 families and a total of 21 commercial businesses of which 10 were located along Main Street. Funds were also expended for permanent flood mitigation projects in the areas of flood-proofing and flood protection.

In order to coordinate all of the various flood mitigation activities, the Granite Falls City Council in February of 2002 appointed a Flood Mitigation Task Force to develop with public input a Final Concept Plan for not only the downtown commercial district but the flood impacted residential areas as well. The task force has met on a regular basis since February of 2002 and has also utilized the services of various consultants who provided expertise in the areas of flood mitigation activities, namely in the areas of acquisition and relocation.

While the Flood Hazard Mitigation Study completed for Granite Falls, also referred to as the Locally Preferred Plan, identified as the top priority acquisition/relocation and/or demolition of residential properties in the flood plain, of somewhat equal importance was the downtown

commercial business district ranked as a second priority out of a total of 7 as identified in the study. Because of the flood elevations established in the 1997 flood and the new projected flood plain elevations as established by the Federal Emergency Management Agency, the City of Granite Falls is now concentrating on acquisitions, demolitions and relocations of commercial properties in the downtown business district located adjacent to the Minnesota River in addition construction of flood mitigation projects in the downtown business district through a combination of both flood proofing existing buildings and the construction of both a retaining wall and the floodwall, the design of which would effectively protect the remaining downtown commercial properties from future flood events.

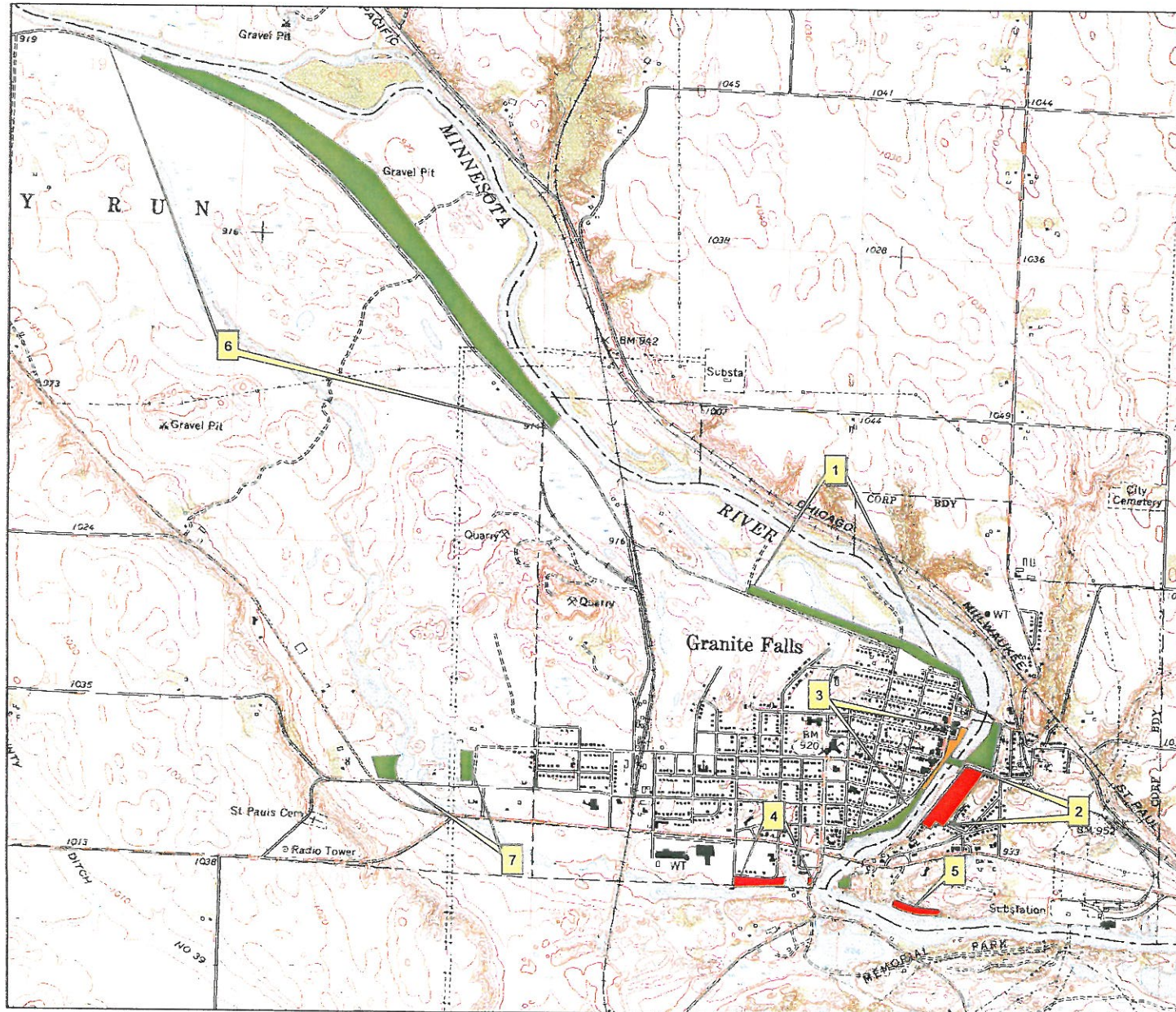
The city anticipates that upon completion of the downtown commercial acquisition/relocation program assistance will be provided to relocate 14 commercial businesses in addition to the future demolition and relocation of City Hall.

Other phases of flood mitigation activities will include installation of permanent pumping stations, raising existing levees, and relocation of the city's Water Treatment Plant. While there are additional flood mitigation projects beyond those just mentioned, the city will again follow the priorities as identified in the Flood Hazard Mitigation Plan which continues to serve as the basis for the city's flood mitigation activities.

II

Locally Preferred Plan

City of Granite Falls Minnesota River Flood Mitigation



LEGEND

- AREA 1 - REACH 1 LEVEE
- AREA 2 - MINNESOTA AVENUE
- AREA 3 - PRENTICE STREET
- AREA 4 - 15TH AVENUE
- AREA 5 - LEFT BANK DOWNSTREAM OF HWY 212 BRIDGE
- AREA 6 - UPPER DIKE ROAD
- AREA 7 - SECONDARY CHANNEL

■ COMPLETED

■ IN PROGRESS

■ FUTURE PROJECTS



09/07/05

0 190 380 760 1,140 1,520 Feet

RELOCATED OUTSIDE CITY LIMITS = 9

LOCALLY PREFERRED PLAN			
AREA 1 - LEVEE RAISE TO 500-YEAR PROTECTION		AREA 4 - 15TH AVENUE	
ITEM	COST	ITEM	COST
Lands	Not determined	Acquisition/relocation of 13 residences along secondary channel and 15th Avenue	1,797,464
Geotechnical program, testing and engineering	60,000	Flood proofing Yellow Medicine County Museum	60,000
Construct 300 lineal feet of floodwall	220,000		
Raise existing levee for 400 lineal feet	32,000		
Construct 500 lineal feet of floodwall	370,000	SUBTOTAL	1,847,646
Reconstruct 500 lineal feet of levee	74,000	Planning, engineering and design	6,000
Raise 500 lineal feet of existing levee	448,000	Construction administration	5,000
Place 16" of mastic for 4,000 lineal feet	131,000	Supervision and administration	1,000
Damage structures	6,000		
SUBTOTAL	1,341,000	TOTAL	1,857,646
Planning, engineering and design	181,000		
Construction administration	94,000	AREA 5 - EAST ALONG THE RIVER DOWNSTREAM OF HWY. 212 BRIDGE	
Supervision and administration	40,000	ITEM	COST
TOTAL	1,636,000	Acquisition/relocation of 3 residences	163,444
ESTIMATE OF FUNDS TO SECURE WITH INFLATION	1,799,600	TOTAL	163,444
AREA 2 - MINNESOTA AVENUE			
ITEM	COST		
Acquisition/relocation of 22 residential properties along Minnesota Avenue and Rock Ridge Lane	1,839,983		
Relocate & reconstruct Water Treatment Plant (lands not included)	4,400,000		
Relocate and Reconstruct Sanitary Lift Station	125,000		
Flood proof Hydro Plant	200,000		
Flood proof Apartment building	30,000		
Construct new pedestrian bridge (cable supported)	860,000		
SUBTOTAL	7,526,000		
Planning, engineering and design	70,000		
Construction administration	410,000		
Supervision and administration	175,000		
TOTAL	9,111,000		
ESTIMATE OF FUNDS TO SECURE WITH INFLATION	7,832,000		
AREA 3 - PRENTICE STREET		AREA 6 - DIKE ROAD EXTENSION	
ITEM	COST	ITEM	COST
Acquisition/relocation of 19 businesses along Prentice Street	3,277,714	Relocation of 2 farms/lands	Not determined
Save North Footprint	141,900	Seismic/structural investigations	25,000
Relocation of City Hall	1,132,149	Raising first low portion of Upper Dike Road	150,000
Acquiring Right-of-Way for Levee Footprint	400,000	Raise 1100 lineal feet of Upper Dike Road 2 feet	63,000
Pump station at intersection of 8th Ave. and 2nd St.	158,000	Construct permanent weir within Upper Dike Road, 1400 L.F.	375,000
Pump station at intersection of 12th Ave. and 7th St.	1,200,000		
Business Completed	764,000	SUBTOTAL	1,133,000
SUBTOTAL	5,873,714	Planning, engineering and design	135,000
Planning, engineering and design	800,000	Construction administration	70,000
Construction administration	250,000	Supervision and administration	32,000
Supervision and administration	100,000	TOTAL	1,381,000
ESTIMATE OF FUNDS TO SECURE WITH INFLATION	8,300,000	ESTIMATE OF FUNDS TO SECURE WITH INFLATION	1,519,100
TOTAL	8,610,774	AREA 7 - SECONDARY CHANNEL	
		ITEM	COST
		Relocation/acquisition of 4 businesses and 5 residences	Not determined
		Obtain channel easements	Not determined
		SUBTOTAL	0
		Planning, engineering and design	0
		Construction administration	0
		Supervision and administration	0
		TOTAL	0

III

Capital Bonding Request

CAPITAL BONDING REQUEST – CITY OF GRANITE FALLS, MN
Minnesota Statute Section 16A.86.

Please accept the following responses relative to the City of Granite Falls 2008 Capital Bonding request, in accordance with Minnesota Statute Section 16A.86, and in response to correspondence dated April 23, 2007, from the Department of Finance.

1. City of Granite Falls
885 Prentice Street
Granite Falls, MN 56241
2. Comprehensive Flood Hazard Mitigation Program
3. N/A
4. The project is located in the City of Granite Falls, in the Counties of Yellow Medicine and Chippewa.
5. The project represents a subsequent phase of the City's long term flood hazard mitigation plan. See attached map "locally preferred plan".

6. **Total Project Costs (all funding sources)**

For Prior Years	For 2008	For 2010	For 2012
\$9m	\$2.2m	\$10m	\$2.8m

2008 - Costs associated with the 2008 Capital Bonding Requests, represent levee improvements and acquisition of right-of-way for levee footprint.

2010 – Costs identified in 2010 represent relocation of the City's water treatment plant out of the flood plain; relocating a sanitary lift station out of the flood plain, and flood proofing the hydroelectric plant.

2012 – Costs identified represent installation of pumping station to minimize flooding and extension of dike and construction of permanent weir.

7. **For Subsequent Project Phases:**

State funds Requested for 2008	State funds to be requested in 2010	State funds to be requested in 2012
\$2.2m	\$10m	\$2.8m

8. The city's Capital Bonding Request in 2008 - In accordance with Minnesota Statute 103F.161, and as authorized by Minnesota Session Laws 2002 Chapter 3618, Sec. 7, Subd. 20, the City of Granite Falls committed \$585,826.00 as the local share, determined by 2% of median household income in the city multiplied by the number of households. These funds were committed as a local match to the Minnesota Department of Natural Resources administered flood hazard mitigation

grant program. In accordance with legislative intent, once the community has documented the 2% local share, which has already been provided to the Department of Natural Resources, the State appropriation is also for the local share of the project.

The 2010 Capital Bonding Request is intended to be a combination of Flood Hazard Mitigation Funding through the Minnesota Department of Natural Resources, local bonding and low interest financing from the State Public Facilities Authority. The exact amounts have yet to be determined.

For Capital Bonding Request year 2012, it is the city's intent to utilize the Flood Hazard Mitigation Grant Program, in accordance with Minnesota Statutes 103F.161.

9. The 2008 Capital Bonding Requests is for \$2.2m and would consist of upgrades to the Reach One Levee, involving raising the level of protection to about the 500 year level. This would involve raising the levee about 3 to 3.5 feet for most of its length, which extends approximately 7,000 feet. In addition, funding is requested for the purpose of acquiring right-of-way for construction of a levee footprint. The right-of-way to be acquired would extend along the backyards of residential properties located south of City Hall, at the downstream end of Prentice Street. Once acquired, the right-of-way would then be cleared, to allow the City to construct temporary levies, to address future flood fighting efforts. The requested funding is consistent with State established policy to mitigate flood damages through flood proofing and/or flood protection. Improvements to the Reach one levee on the North side of the City, would afford flood protection for approximately 200 single family residential homes. This request is further consistent with the city's locally preferred plan, which has as its objective, to identify, evaluate and prioritize public health safety and property damage risks, and to develop plans for implementation of flood mitigation measures.

The City's 2010 Capital Bonding Request includes funding for relocation of the City's Water Treatment Plant out of the flood plain, relocation of a sanitary lift station and flood proofing of the City's Hydroelectric Plant. These projects are again consistent with the City's locally preferred plan, to address both health and safety risks. The City views this request as having State wide significance in reducing both State and Federal funds expended for flood fighting efforts, within the flood impact areas of the community. Relocation of the water treatment plant out of the flood plain would mitigate against future damage and address public health and safety risks associated with flooding inundation occurring in and around the water treatment plant. Relocation of the sanitary lift station above the flood plain elevation would mitigate against future floods impacting this area, thus causing the sanitary sewer to back up throughout the community. This solution would again address public health and safety needs, consistent with State wide policy relative to the Flood Hazard Mitigation Grant Program.

The 2012 Capital Bonding Request includes funds for the construction of a permanent pumping station to remove interior drainage during future flood events. The proposed location for the pumping station is within both a residential and highway commercial area that experienced flooding during the 1997 and 2001 flood events. The 2012 Capital Bonding Request will also provide funds to construct a permanent weir along a portion of a dike, which currently functions as a flood protection structure. The significance of this project would address secondary channel flooding along a particular segment of the dike, which redirects flood waters into a secondary channel, thereby reducing impacts along the main channel through the City. The permanent weir would extend a distance of approximately 1400 feet to maintain the spill flow that occurs during major flood events. Again, the Capital Bonding Requests proposed for 2012 is consistent with the City's locally preferred plan and is of State wide significance in reducing both State and Federal funds expended for flood fighting efforts, within the flood impact areas of the Community. Should the City be successful in obtaining funding in the years identified, those projects listed in the City's locally preferred plan for flood damage reduction will have been addressed.

10. The City of Granite Falls will own, operate and maintain those projects for which funding have been requested.

11.

	2008	2010	2012
Land acquisition	200,000	150,000	
Pre-design	20,000	200,000	150,000
Design (Including construction administration)	177,100	2,221,000	300,000
Project Management	147,400	499,000	150,000
Construction	1,655,500	6,930,000	2,200,000
Furniture/Fixtures/Equipment			
Relocation			

12. With respect to the City's 2010 Capital Bonding Request for relocation of the Water Treatment Plant out of the flood plain, it is anticipated that the newly constructed water treatment plant will be approximately 7,560 square feet. As to repairs and/or improvements to the City's existing levee system, please direct your attention to the attached map and, in particular, areas 1 and 6, which identify the lineal feet impacted for improvements to the City's existing flood protection levies.

13. Not applicable.

14. **PROJECT SCHEDULE**

	2008	2010	2012
Construction begins	Apr. 2009	Apr. 2011	Apr. 2013
Construction ends	Oct. 2009	Oct. 2012	Oct. 2013

15. With regard to construction projects of at least \$1.5 m for the 2008 Capital Bonding Request, a project pre-design has not been submitted to the Commissioner of Administration as the project is consistent with the City's locally preferred plan, as accepted by the Minnesota Department of Natural Resources, based upon previous capital bonding requests. For capital bonding year 2010, the City has completed a water plant feasibility study and will be listed on the project priority list as maintained by the State Public Facilities Authority. A copy of the feasibility study is on file with the Minnesota Department of Health. A project pre-design report has not been submitted to the Commissioner of Administration at this time.

For those projects identified in the City's 2012 Capital Bonding Request a project pre-design report has not been submitted.

16. Not applicable.

- 17 & 18. Regarding sustainable building guidelines – These guidelines would not be applicable to the 2008 Capital Bonding Request. Regarding 2010, the sustainable building guidelines would be incorporated into the project design. For 2012 – not applicable.

19. See attached Resolution of Support from the Granite Falls City Council.

20. William P. Lavin, City Manager
885 Prentice Street
Granite Falls, MN 56241
Phone: 320-564-3011
Fax: 320-564-3013
E-mail: bill.lavin@granitefalls.com

IV

Project Summaries



MEMO

Minneapolis, MN

TO: William Lavin
City of Granite Falls, MN

DATE: August 9, 2007

FROM: Jason Jacks
Stanley Consultants, Inc.

SUBJECT: Granite Falls Flood Protection
Prentice Street Businesses

Phase 1 Floodwall

Phase 1 of the Granite Falls Flood Protection Project involved construction of an approximately 310' floodwall extending from the north edge of the former Ladner Hardware building to the north side of the former Aus Warehouse building. The floodwall serves to protect the lower level of several businesses along Prentice Street in the heart of the city's downtown business district. Businesses protected by construction of the floodwall include Granite Floral, Classic Cuts Hair Salon, The Advocate Tribune, Frozen in Time Photography, and Erickson Dentistry (formerly Aus Floors and More). Included in the floodwall design is a 14' stoplog closure at 7th Avenue that allows for continued vehicular access to the riverfront during non-flood conditions.

Along with the former Ladner Hardware building, the City of Granite Falls conducted buyouts of two warehouse structures along the floodwall reach. The Ims warehouse and the Aus Floors warehouse properties, each of which were subject to flooding in 1997 and 2001, were purchased and demolished along this reach. The photos below indicate the pre-construction condition of the Phase 1 reach.



Figures 1 and 2 – Preconstruction Photos Looking North Along the Phase 1 Reach.

The Phase 1 floodwall was constructed to an elevation of 904.5, which corresponds to the Corps of Engineers' 100-yr design flood elevation of 903.2 with an additional 1+ feet of freeboard protection. The above-grade height of the wall ranges from approximately 2' at the far north end of the wall to nearly 10' at the south end where the wall ties into the former Ladner Hardware building.



Figure 3 - Phase 1 Floodwall

Floodproofing of the former Ladner Hardware building was also included as part of the Phase 1 protection. The lower portion of the former Ladner Hardware building was chosen as a floodwall tie-in as the lower level is constructed with 12" poured concrete walls with sufficient strength to withstand floodwater pressure differentials. A large fillet-like concrete support and groundwater drain system were added along the north basement wall to provide structural support and minimize uplift pressures on the base slab during flood conditions.

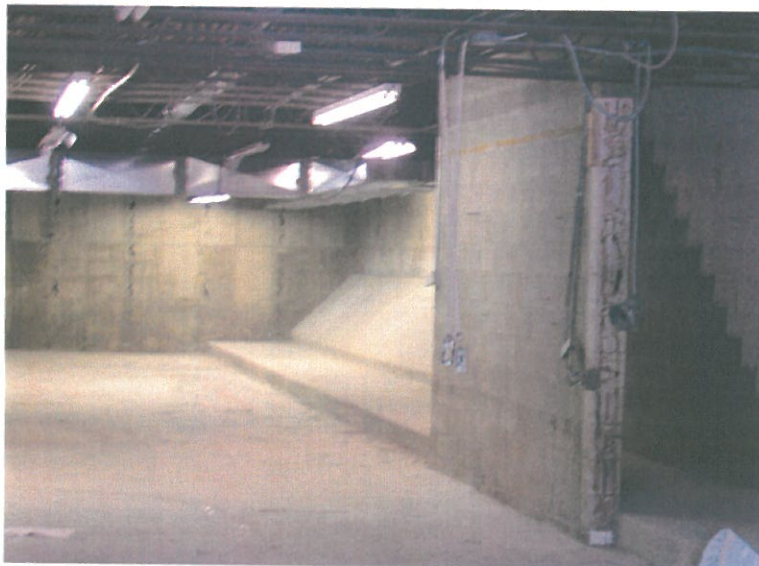


Figure 4 – Former Ladner Hardware Lower Level Floodproofing

Phase 2 Reaches

Phase 2 of the Granite Falls Flood Protection Project was divided into four individual reaches to accommodate timeframes in which demolition and construction could take place. Phase 2 involves City buyouts of various businesses and properties along Prentice Street south of the former Ladner Hardware building. The general concept of the four separate Phase 2 reaches is to buyout and demolish structures whose first-floor elevations fall within the 100-yr flood elevation. The demolished areas are then restored by utilizing massive-block retaining walls capable of withstanding heavy flow conditions and debris impacts along with earthen, turf-reinforced slopes extending from the riverside alley to the Prentice Street sidewalk.

Phase 2, Reach 1 demolition and restoration contracts were awarded in the fall of 2006. Reach 1 businesses bought out and temporarily relocated include Michael Juenemann, CPA, Mike Jensen Thrivent Financial, and Total Image Salon. A city-owned utility and abandoned storage structure under the approach to the pedestrian bridge was also demolished as part of this reach. The photos below indicate the pre- and post-construction conditions for Phase 2, Reach 1 of the flood protection project.



Figures 5 and 6 – Pre-construction Photos of Phase 2, Reach 1 Structures.



Figures 7 and 8 – Post-construction Photos of Phase 2, Reach 1 Retaining Wall.

The remaining three reaches of the Phase 2 Flood Protection Project are slated for demolition and/or construction in 2008 – 2009 upon complete renovation and relocation of various businesses to the former Ladner hardware building as well as construction of a new City Hall. These remaining reaches are shown in the photos below.

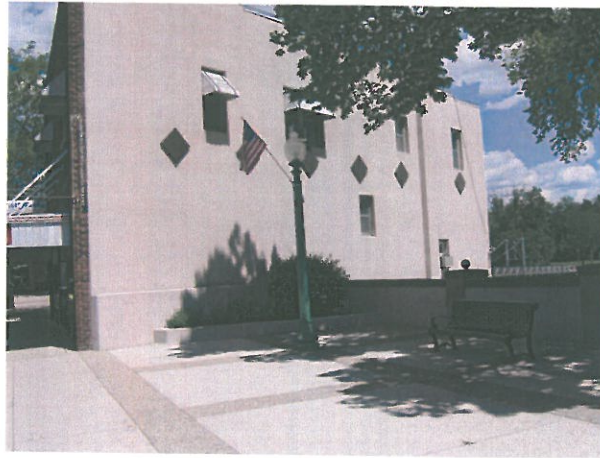


Figure 9 – Reach 2, Korthius Jewelry



Figure 10 – Reach 3, State Farm Insurance, Erickson D.D.S., and Copeland D.D.S.



Figure 11 – Reach 4, City Hall

LADNER BUILDING REDEVELOPMENT

Phase I Remodeling

To accommodate the space needs of displaced downtown businesses, the Ladner Building was determined to be appropriate for flood proofing and remodeling.

The main floor of 9070 sq. ft. was designed to provide five (5) tenant spaces ranging from 645 sq. ft. to 2,254 sq. ft. Two (2) tenant spaces have exterior entrances and the others are accessed from a central corridor that also contains restrooms and support spaces. Each tenant space is served by its own heating/ventilation/air conditioning equipment and temperature control.

The building's storefront and south exterior wall was re-clad with stone aggregate panels. The storefront was also upgraded with new windows, aluminum entrances and awnings. At other exterior walls, existing windows were replaced and additional windows were incorporated to capture natural lighting and views of the Minnesota river.

A new roofing system with metal flashings and additional insulation was installed throughout the roof.

In Phase I, the tenant spaces were left unfinished pending completion of lease agreements.

Phase 2 Remodeling

With four (4) lease agreements completed to date, preparation of construction documents is underway for the build-out/finishing of a jewelry store, two (2) insurance offices and an accountant's office. Contractor's bids are scheduled to be received on September 13, 2007. Occupancy for these businesses is planned for February 2008.