

**PRELIMINARY ENGINEERING REPORT
STREET IMPROVEMENT DISTRICT 2017-6
CHESTNUT DRIVE
HORACE, NORTH DAKOTA
May, 2017
W17-00-063**

INTRODUCTION

Horace is located in east central North Dakota along the Sheyenne River between Cass County Highway 14 and 52nd Avenue South on Cass County Highway 17. The area economy is based upon agriculture, light manufacturing and commercial business. The 2010 population was 2,430 residents. This report reviews five street improvement districts within the City. A project location map is included at the end of this report.

EXISTING CONDITIONS

- Street Improvement District 2017-6 – Complete Reconstruct and/or Rehabilitation Improvements
 - This area consists of Chestnut Drive.
 - The area currently has 46 homes. The existing streets are an urban section with concrete curb and gutter and a bituminous surface.
 - The pavement width is 28' back of curb to back of curb.
 - The existing roadway is experiencing curb and gutter settlement that is affecting the drainage on the roadway.
 - The roadway is also experiencing some settling, pavement breakups and the pavement is starting to deteriorate due to the standing water and poor drainage on the roadway.
 - The roadway is also experiencing a significant amount of movement due to subsurface moisture in the area.
 - The existing storm sewer system has also experience backup problems over the years. In examining the existing storm sewer sytem and the design calculations it was determined that the wet well and pumps are designed to convey a 2-year event to the Sheyenne River.
 - The cross section of the roadway has fabric, 6-inches of aggregate base and 6-inches of hot bituminous asphalt. Chestnut Drive also has three corner cul-de-sac's.

PROPOSED IMPROVEMENTS

The purpose of the project is to rehabilitate or construct/reconstruct the pavement section and improve project drainage on Chestnut Drive in the City of Horace. The proposed project would utilize various construction techniques

depending on the condition of the existing pavement, inlets, curb and gutter, storm sewer, and surface drainage in the area. An Opinion of Probable Project Cost and Proposed Improvement maps for each area are attached at the end of this report.

- Street Improvement District 2017-6 – Complete Reconstruct and or Rehabilitation Improvements

RECONSTRUCTION OPTION

- Option one would include the existing roadway, curb and gutter and driveways to be removed within the right of way.
- The aggregate base course would be removed and salvaged.
- The storm sewer system would be upgraded with a new wet well and pumps to handle the current storm water flows. Upgrading to another wet well would eliminate standing water in the streets during larger rain events.
- PVC edge drain would be installed behind the new curb and gutter to try and take care of the subsurface water problems. The PVC Edge drains could also be used to plumb sump pump drainage into from the houses to get water off of the street and out of the sanitary sewers..
- New concrete curb and gutter and driveways would be installed within the right of way.
- The roadway would receive subgrade preparation, geotextile fabric, 6" aggregate base coarse CL5, and a 5" hot bituminous asphalt mat.
- All manholes, inlets and water valve boxes would be adjusted to match the new pavement elevation.

MILL & OVERLAY AND MUDJACKING OPTION

- 1) Option two would include a 2-inch edge mill, patching and mud jacking of curb and gutter, replacement of the curb and gutter that is unable to be mudjacked.
- 2) Curb and Gutter would be mudjacked where possible and replacement of curb and gutter would be required where mudjacking is not possible.
- 3) The storm sewer system would be upgraded with a new wet well and pumps to handle the current storm water flows. Upgrading to another wet well would eliminate standing water in the streets during larger rain events.
- 4) PVC edge drain would be installed behind the existing curb and gutter to try and take care of the subsurface water problems. The PVC Edge drains could also be used to plumb sump pump drainage into from the houses to get water off of the street and out of the sanitary sewers.

- 5) A hot bituminous leveling course would be installed to help to level the existing bituminous streets to re-establish the crown on the street.
- 6) Bad areas of the pavement would be excavated out and patched.
- 7) A 2" hot bituminous asphalt overlay would then be placed on the full width of the road.
- 8) A bituminous seal coat would then be installed over the hot bituminous pavement.
- 9) All gate valves and manholes would be adjusted to match the new pavement elevation.

ATTACHMENTS

- Opinion of Probable Project Cost
- Project Location Map
- Proposed Improvements Maps
- Benefitting Area Maps

APPROVALS

All improvements will be designed in accordance with current engineering standards.

The Horace City Council will need to approve the Preliminary Engineering Report for Street Improvement District 2017-6.

After approval of the Preliminary Engineering Report the Horace City Council would then direct the City Engineer to prepare Plans and Specifications for the Project.

After the Plans and Specifications are prepared by the City Engineer the Horace City Council will approve the Plans and Specifications for the Project and then the Horace City Council will need to pass a resolution to advertise the project for bidding.

After bids are received for the project and publically opened the Horace City Council would award the project to the lowest responsible, responsive bidder.

PERMITS

No permits will be required for this project.

METHOD OF CONSTRUCTION

The project would be bid competitively with a public bid opening.

PROJECT FINANCING

The Engineer's Opinion of Probable Total Project Cost is \$1,997,000.00 for a total reconstruction or 921,868.75 for a mill and overlay for the proposed project.

The project cost would be special assessed to the benefitting areas. A Benefitting Area map is attached at the end of this report for each district.

There are a total of 46 residential homes in the benefitting area for all of the projects combined.

- **Chestnut Subdivision**

Chestnut subdivision consists currently of 46 homes.

- The Estimated Cost for the **Reconstruction** project in Chestnut Subdivision is \$1,997,000.00. If the total cost for the project is assessed equally to all 46 homes in the benefitting area the cost for each home would be approximately \$43,413.04. This approximate cost per home is based upon the estimated cost of the project of \$1,997,000.00.
- The Estimated Cost for the **Reconstruction** project in Chestnut Subdivision is \$921,868.75. If the total cost for the project is assessed equally to all 46 homes in the benefitting area the cost for each home would be approximately \$20,040.63. This approximate cost per home is based upon the estimated cost of the project of \$921,868.75.

If you have any questions concerning this report, please do not hesitate to contact me.

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APPENDIX A
PROJECT LOCATION MAP

Street Improvement District 2017-6

Complete Reconstruct and or Overlay Improvements

Chestnut Drive



APPENDIX B
OPINION OF PROBABLE PROJECT COST

Engineer's Opinion of Probable Project Cost
 Street Improvement Chestnut Dr
 Horace, North Dakota
 Street Improvement District 2017-6
 Jun-17

Complete Reconstruction
 Subgrade Prep, Aggregate Base, Storm Sewer, Curb and Gutter, 5" Bituminous Overlay
 Proposed 24' Finished Top Width

Item No.	Item	Unit	No. of Units	Probable Unit Price	Probable Total Cost
1	Mobilization	LS	1	\$ 50,000.00	\$ 50,000.00
2	Contract Bond	LS	1	\$ 15,000.00	\$ 15,000.00
3	Remove and Salvage Aggregate Base	CY	2800	\$ 20.00	\$ 56,000.00
4	Aggregate Base Coarse (CL 5) In Place	CY	3800	\$ 40.00	\$ 152,000.00
5	Bituminous Material, PG 58-28	TON	250	\$ 450.00	\$ 112,500.00
6	Hot Bituminous Pavement - Class 29	TON	4,100	\$ 50.00	\$ 205,000.00
7	Fabric	SY	17,000	\$ 2.50	\$ 42,500.00
8	Subgrade Preperation	STA	50	\$ 1,000.00	\$ 50,000.00
9	Remove and Replae Curb and Gutter	LF	8,500	\$ 30.00	\$ 255,000.00
10	4" PVC Edge Drain	LF	8,500	\$ 15.00	\$ 127,500.00
11	Bituminous Removal	SY	13,500	\$ 6.00	\$ 81,000.00
12	Remove and Replace Concrete Driveway	SY	1,600	\$ 60.00	\$ 96,000.00
13	Manhole Adjustment	EA	16	\$ 750.00	\$ 12,000.00
14	Inlet Adjustment	EA	16	\$ 500.00	\$ 8,000.00
15	Water Valve Adjustment	EA	2	\$ 250.00	\$ 500.00
16	Storm Sewer Upgrade	LS	1	\$ 250,000.00	\$ 250,000.00

Opinion of Probable Bid Cost \$ 1,513,000.00
 Contingencies (10%) \$ 151,000.00
 Opinion of Probable Construction Cost \$ 1,664,000.00

Engineering, Legal, Administrative and Bonding (20%) \$ 333,000.00
 Opinion of Probable Project Cost \$ 1,997,000.00

Engineer's Opinion of Probable Project Cost
 Street Improvement Chestnut Dr
 Horace, North Dakota
 Street Improvement District 2017-6
 Jun-17

2-inch edge Mill with a 2-inch HBP overlay, Patching, Mud Jacking of Curb,
 Gate Valve and Manhole adjustment and a Seal Coat
 Proposed 24' Finished Top Width with One Alternative

Item No.	Item	Unit	No. of Units	Probable Unit Price	Probable Total Cost
1	Milling	SY	13,100	\$ 4.50	\$ 58,950.00
2	Mobilization	LS	1	\$ 30,000.00	\$ 30,000.00
3	Aggregate Base Coarse (CL 5) In Place	CY	300	\$ 40.00	\$ 12,000.00
4	Bituminous Material, PG 58-28	TON	140	\$ 550.00	\$ 77,000.00
5	Hot Bituminous Pavement - Class 29	TON	2,100	\$ 50.00	\$ 105,000.00
6	Patching	SY	1,400	\$ 25.00	\$ 35,000.00
7	Bituminous Tack Coat CSS-1h	GAL	2,000	\$ 3.00	\$ 6,000.00
8	Mud Jacking Concrete Curb	LF	1,850	\$ 25.00	\$ 46,250.00
9	Remove and Replae Curb and Gutter	LF	100	\$ 50.00	\$ 5,000.00
10	Gate Valve Adjustment	EA	5	\$ 500.00	\$ 2,500.00
11	Manhole Adjustment	EA	15	\$ 750.00	\$ 11,250.00
16	Storm Sewer Upgrade	LS	1	\$ 200,000.00	\$ 200,000.00
10	4" PVC Edge Drain	LF	8,500	\$ 15.00	\$ 127,500.00
12	Remove and Replace Concrete Driveway	SY	200	\$ 60.00	\$ 12,000.00
12	Reset Inlets	EA	4	\$ 1,500.00	\$ 6,000.00

Opinion of Probable Bid Cost \$ 734,450.00
 Contingencies (10%) \$ 46,500.00
 Opinion of Probable Construction Cost \$ 780,950.00

Engineering, Legal, Administrative and Bonding (10%) \$ 78,095.00
 Opinion of Probable Project Cost \$ 859,045.00

Alternative #1					
1	Bituminous Seal Coat CRS-2P	GAL	5,550	\$ 3.50	\$ 19,425.00
2	Seal Aggregate (Class 41)	TON	200	\$ 40.00	\$ 8,000.00

Opinion of Probable Bid Cost Alt. #1 \$ 27,425.00

Opinion of Probable Bid Cost Including Alt. #1 \$ 761,875.00
 Contingencies (10%) \$ 76,187.50
 Opinion of Probable Construction Cost Including Alt. #1 \$ 838,062.50

Engineering, Legal, Administrative and Bonding (10%) \$ 83,806.25
 Opinion of Probable Project Cost Including Alt. #1 \$ 921,868.75

APPENDIX C
PROPOSED IMPROVEMENTS MAPS

Street Improvement District 2017-6

Complete Reconstruct and or Overlay Improvements

Chestnut Drive



APPENDIX D
BENEFITTING AREA MAPS

Street Improvement District 2017-6
Benefitting Area Map
Complete Reconstruct and or Overlay Improvements
Chestnut Drive

