VILLAGE OF DIAMOND

NORTHSIDE STORMWATER MANAGEMENT PLAN

NOVEMBER 10, 2021

Chamlin & Associates
ENGINEERS • SURVEYORS • PLANNERS

Project No. 15465.00

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NORTHSIDE STORMWATER MANAGEMENT PLAN

FOR

VILLAGE OF DIAMOND, ILLINOIS

DATED: NOVEMBER 10, 2021

I certify that this study was prepared by me or under my direct supervision, and that I am a duly registered Professional Engineer in the State of Illinois.

_____

Timothy R. Hejny, P.E. Date
License No.: 062-059133

Chamlin & Associates, Inc.
Design Firm License: Illinois No.: 184-001717 SEAL

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INTRODUCTION

This drainage study was prepared at the request of the Village of Diamond to explore the possibility of constructing a regional stormwater detention basin to alleviate flooding and drainage issues in the northside of town, bounded by Illinois Route 113 to the south, Valerio Road to the north, Will Road to the east and the North McGinty to the west. Below is an aerial image with the limits of the studied area outlined in red.

Figure #1 – Google Earth Image (04/2017)

EXISTING CONDITIONS

The part of town that is the subject of this study consists mostly of single-family homes with a few commercial properties along Illinois Route 113, some multi-family properties, and a thirty-acre mobile home development. The total developed area within the approximate limits of this study is ±150 acres. Most of the studied area is considered flat, with an average ground slope of 0% to 2% with the general lay of the land sloping from the south to the north. The primary soil type in the study area is Hydrologic Soil Type C. This type of soil has a slow infiltration rate when thoroughly wet due to a soil layer that impedes the downward movement of water. The following image shows the general drainage pattern for the studied area.

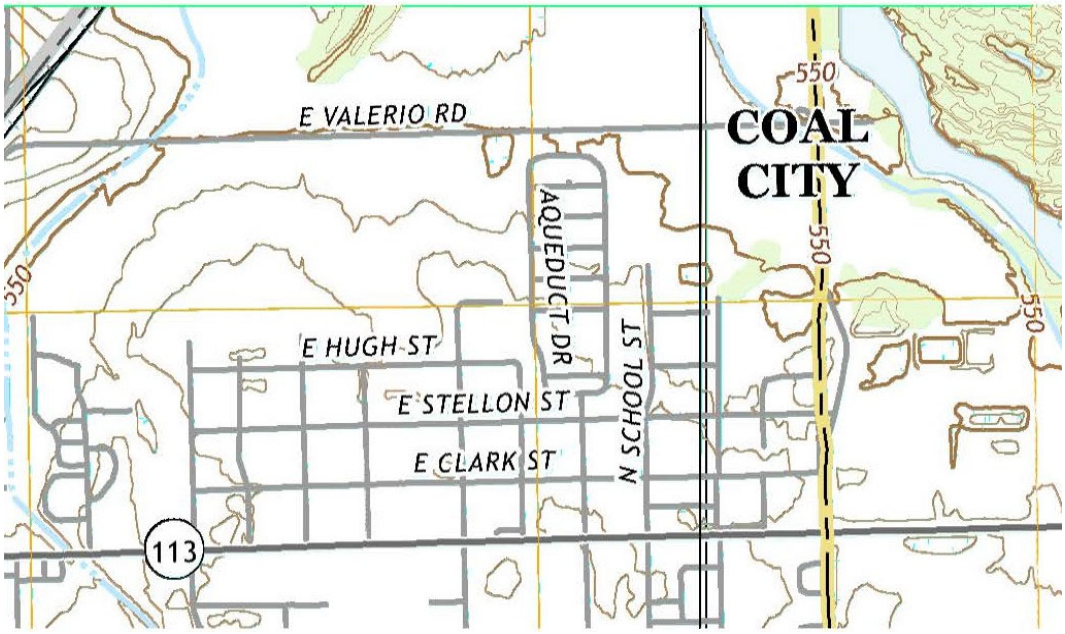


Figure #2 (not to scale)
USGS Coal City Quadrangle
USGS Wilmington Quadrangle

Much of this area was developed in the 1970s when stormwater management practices were rarely applied to development. Only a limited amount of storm sewer has been installed in the studied area and locations where ditches along the roadways have been constructed, they are very shallow and cannot convey much runoff. Because of the existing conditions of this area, when larger storm events occur there is usually standing water in the low areas. The following are pictures of the studied area that represent typical right-of-way infrastructure that is common in the studied area.

Figure #3 - Caulkey Street Looking South (12/09/2020)

Figure #4 - Dewey Street Looking North (12/09/2020)

PROPOSED OPTIONS

The best method to stop the re-occurring drainage issues in the studied area is to remove the stormwater runoff from the area as quickly as possible. This requires directing the run-off to an area where it can collect, without negatively impacting the downstream property owner, and then be slowly released at a controlled rate to the downstream waterway. The 25-acre parcel located at the southwest corner of Valerio and Will Road, at the northeast corner of the study area would be a suitable location for a regional detention basin for multiple reasons. Firstly, as shown in Figure #5, below, about ±40% of the parcel is encumbered with the 0.2% Annual Chance Flood Hazard (500-year floodplain). The presence of the floodplain on this parcel places restrictions on potential future development.

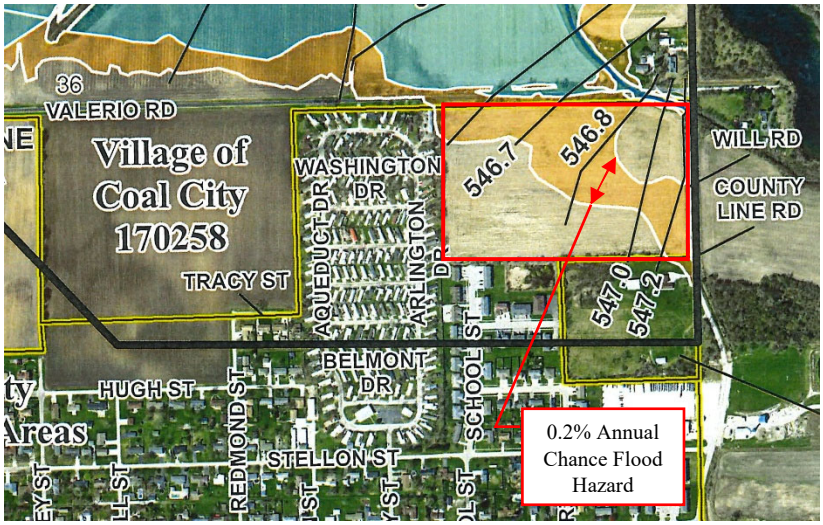


Figure #5 – LOMR 18-05-6349P

Secondly, the Claypool Ditch passes through the northeast corner of this parcel, which would provide a suitable outlet discharge location for the regional stormwater detention basin. The depth of the ditch would allow for approximately 7 feet storage in the detention basin which would result in approximately 135 acre-feet of stormwater run-off volume (a typical cross section of the detention basin is included in the appendix of this study). Because concentrated discharges from developed areas must enter a conveyance system (Claypool Ditch) that is capable of carrying the additional flow, without overburdening the system, the discharge from the regional detention basin would be restricted. Lastly, the land use as a regional detention basin would be compatible with the surrounding land uses. The parcel is currently located within the municipal limits of the Village of Diamond and is zoned agricultural, which is the current use. The surrounding properties are mostly zoned and used for residential and/or used for agricultural purposes (an exhibit showing the adjacent property owners and associated zoning is included in the appendix of this study). Having a regional detention basin that utilized as a park-type facility would be an asset to the Village and surrounding properties. The methodology for sizing the stormwater detention basin is based on the adopted requirements of the Will County Stormwater Ordinance.

For the regional detention basin to function effectively, a storm sewer system will need to be constructed to collect the run-off within the impacted area. The storm sewer system will be constructed within the existing village right-of-ways and alleys to avoid having to go through the process of land or easement acquisition. Once the storm sewer system is constructed, village residents will the option of improving the drainage on their property by re-grading their yards to provide positive drainage to the right-of-way or alley, installing yard inlets on their property to collect run-off, connecting their gutter downspouts to the storm sewer system and/or connecting their sump pump discharge lines to the storm sewer system.

Due to the magnitude of the overall project (land acquisition, regional detention basin earthwork, storm sewer system construction, etc.), it is assumed to that the project will occur in several phases. For the purposes of this study, the project was split into three phases, with an Engineer's Estimate of Cost of each phase (included in the appendix of this study). Phase One is proposed to include the land acquisition for the regional detention basin and park, excavation of the detention basin, concrete path associated amenities and park improvements. Phase Two is proposed to include the storm sewer system construction on Caulkey Street, East Stellon Street, the alley between Route 113 and Clark Street and the alley between Clark Street and Stellon Street. Phase Three is proposed to include the storm sewer construction on Tracy Street, Hugh Street and Stellon Street. An exhibit of the proposed phasing is included in the appendix of this study. Limits of the phasing are subject to change based on the availability of financing.

Alternate parcels along the north side of the Village were investigated to be used as a regional detention basin. Upon closer investigation, it was determined that these parcels would be less desirable because they are outside of the municipal limits of Diamond and/or a suitable outlet for the basin is not in a convenient location.

PROPOSED AMENITIES

In an effort to incorporate multiple uses where practical, as part of this project, the regional detention basin would also have recreational amenities. The perimeter of the detention basin will have an eight-foot-wide concrete multi-use path. The total length of the path will be approximately one-tenth of a mile. Along the path there will be twelve fitness stations with instruction on how to perform exercises, similar to the ones shown in the pictures below.

Figure #6 - Typical Fitness Stations

Also, there will be two wooden piers with railings along the shoreline, similar to the picture below.

Figure #7 - Typical Wooden Pier

Lastly, along the south side of the proposed regional detention basin, there is an existing detention basin which was constructed as part of the Orchard Park Subdivision. Because the proposed regional detention

basin would be providing a significant amount of detention storage, this existing detention system would become redundant. Ideally, the 0.88 acres that is an existing detention basin would be converted into a park with playground equipment. This park would be accessed by the proposed multi-use path or North Caulkey Street, if it is extended in the future. The area of the future park is shown in red in the image below.

Figure #8 – Google Earth Image (04/2017)

The existing detention basin is owned by two separate, private entities with an easement that covers the detention basin granted to the Village. To convert the detention basin into a park, the Village would have to acquire the 0.88 acres from the private owners through a lot-split or minor subdivision and vacate the existing detention easement.

A graphical depiction of the Regional Stormwater Detention Basin and the associated amenities is included in the appendix of this study.

PROPOSED MAINTENANCE

Maintenance to a regional detention basin is minimal. Post construction, the basin should be stocked with a variety of fish to promote a heathy aquatic ecosystem. The basin should not have to be restoked if the water quality of the basin is maintained at a good level. The aerators in the basin should be removed in the fall so that they are not damaged by ice, then reinstalled in the spring. The exercise equipment and pier should be inspected on a bi-annual basis for damage and repaired as necessary. Trash collection and lawn mowing should be performed on a weekly basis by the Village's Public Works Department.

The proposed storm sewer system will require yearly (at the minimum) inspection of the manholes and catch basins to determine if there is any sedimentation collection, which should be removed as need. This task can be performed by the Village Public Works Department. The storm sewer pipes should be televised every 5-10 years to inspect for joint failure, blockage and/or tree root penetration. Damage should be repaired as needed to prevent flooding.

PERMITTING AGENCIES

The scope of a project like this would require multiple permitting agency approvals. The following is a list of the anticipated permits that would be required:

- Approval from the Claypool Drainage and Levee District will have to be granted for the direct discharge into the Claypool Ditch.
- Because the land disturbance will be greater than one acre, an Illinois Environmental Protection Agency General NPDES Permit will be required.
- An Illinois Department of Natural Resource's EcoCAT consultation will be required to determine if there are any endangered or protected species in the area of the proposed disturbance.
- The Illinois State Historic Preservation Office Cultural Resources Protection Program will review the area to be disturbed to verify that there is no significant historic, architectural or archaeological resources that will be effected by this project.
- A Federal Emergency Management Agency (FEMA) Letter of Map Revision (LOMR) will be required because the construction of the proposed regional detention basin will change the limits of the 1% Annual Chance Flood Hazard (100-year floodplain). The Letter of Map Revision will update the Flood Insurance Rate Map to reflect the limits of the proposed regional detention basin as the 1% Annual Chance Flood Hazard.

FINANCING

A project with a scope of this magnitude is an expensive endeavor. It is likely that the Village will have to pursue grants to acquire the necessary money for the land acquisition and proposed improvements. The following are some of the available grants that could be applied for to get assistance with this project:

- Illinois Department of Natural Resources *Land and Water Conservation Fund* (LWCF) – Provides funding assistance to local units of government to acquire land for public outdoor recreation uses. Note that most grants which are for land acquisition will only pay "fair market value" for the land, as determined by an approved land appraiser. If the land owner will only sell their property at a cost that exceeds the fair market value, the Village will have to generate the additional money above the fair market value.
- Illinois Department of Natural Resources *Open Space Lands Acquisition and Development* (OSLAD) – Provides funding assistance for areas of general purpose, public outdoor recreation use such as neighborhood and community park areas, play fields as well as public parklands for passive recreation uses.
- US Department of Housing and Urban Development *Community Development Block Grant Program* (CDBG) – Provides assistance with infrastructure projects and public facilities installation.

It should be noted that grants often require cost sharing with the local unit of government, which can result in the local government paying 20% to 50% overall cost of the project. Additionally, project incidental costs such as application preparation, attorney fees, consultant fees, appraising fees and title costs are often not eligible to be paid for through grants. Some grants, if awarded, have a set timeline for when the money that is awarded has to be used/spent.

REFERENCES

Drainage Manual Committee for IDOT Division of Highways. July 2011. IDOT Drainage Manual. Springfield, IL: Illinois Department of Transportation.

Federal Emergency Management Agency Letter of Map Revision Determination Document, Case No.: 18-05-6349P, Effective date: October 18, 2019.

Floyd A. Huff and James R. Angel. 1989. Frequency Distributions and Hydroclimatic Characteristic of Heavy Rainstorms in Illinois. Illinois State Water Survey, Champaign, Bulletin 70.

D.L. Uchtmann and Bernard Gehris. December 1997. Illinois Drainage Law. College of Agricultural, Consumer and Environmental Sciences University of Illinois at Urbana-Champaign.

Map showing image of Diamond. *Google Earth*, earth.google.com/web/.

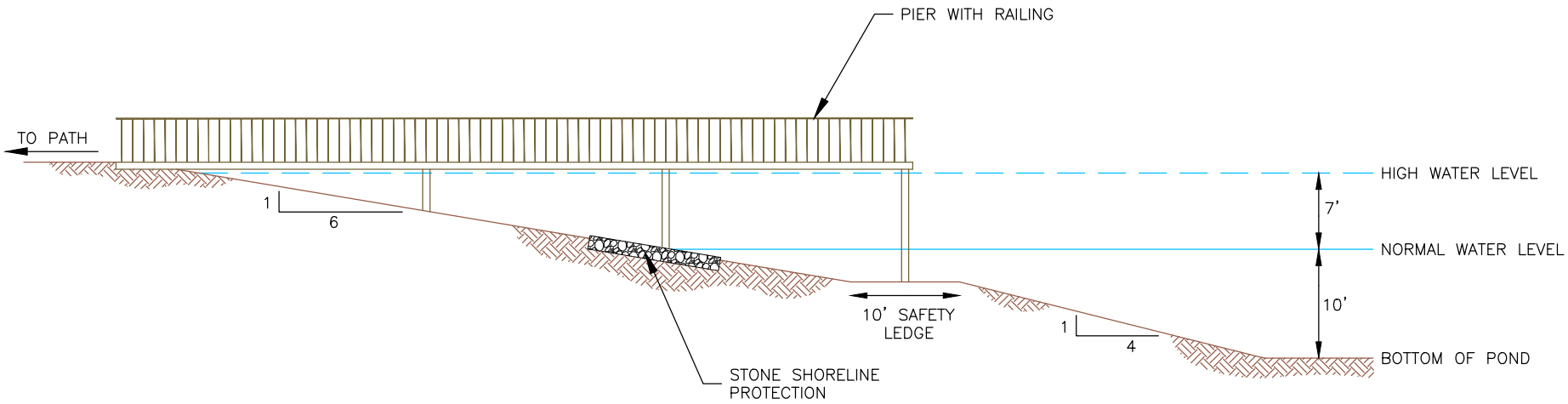
United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey.

United States Geological Survey Coal City Quadrangle, 2018.

United States Geological Survey Wilmington Quadrangle, 2018.

Appendix A
Detention Basin Cross Section at Pier

DETENTION BASIN CROSS SECTION AT PIER



DRAWN BY: TRH	DATE: 6/14/2021
CHECKED BY: TRH	JOB NO.: 15465.00
SCALE: 1" = 15'	FILE NO.: 15465.00

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Drawing Name: H:\AJOB\15\15465-00 DIAMOND NORTHSIDE STORMWATER MANAGMENT PLAN\CAD\EX02 POND SEC.dwg Last Modified: Oct 13, 2021 – 10:05am Plotted on: Oct 13, 2021 – 10:05am by timhejny

Appendix B
Adjacent Property Owners

BERTA B HYER & BLANCHETTE J
120.34 ACRES
ZONED RS–1 (COAL CITY)

SCAMEN CASEY R
ZONED RS–1 (COAL CITY)

VALERIO ROAD

CLAYPOOL DITCH

FARCUS RICHARD J
28.734 ACRES
ZONED RS–1 (COAL CITY)

CALCATERRA FLOYD TRUST
26.00 ACRES
ZONED A1

WILL ROAD

WASHINGTON DRIVE

HAWTHORNE DRIVE

AQUEDUCT DRIVE

ARLINGTON DRIVE

BURT ESTATES PROPERTY, LLC
29.49 ACRES
ZONED R5

SPORTSMAN DRIVE

FAIRMONT DRIVE

SCHOOL STREET

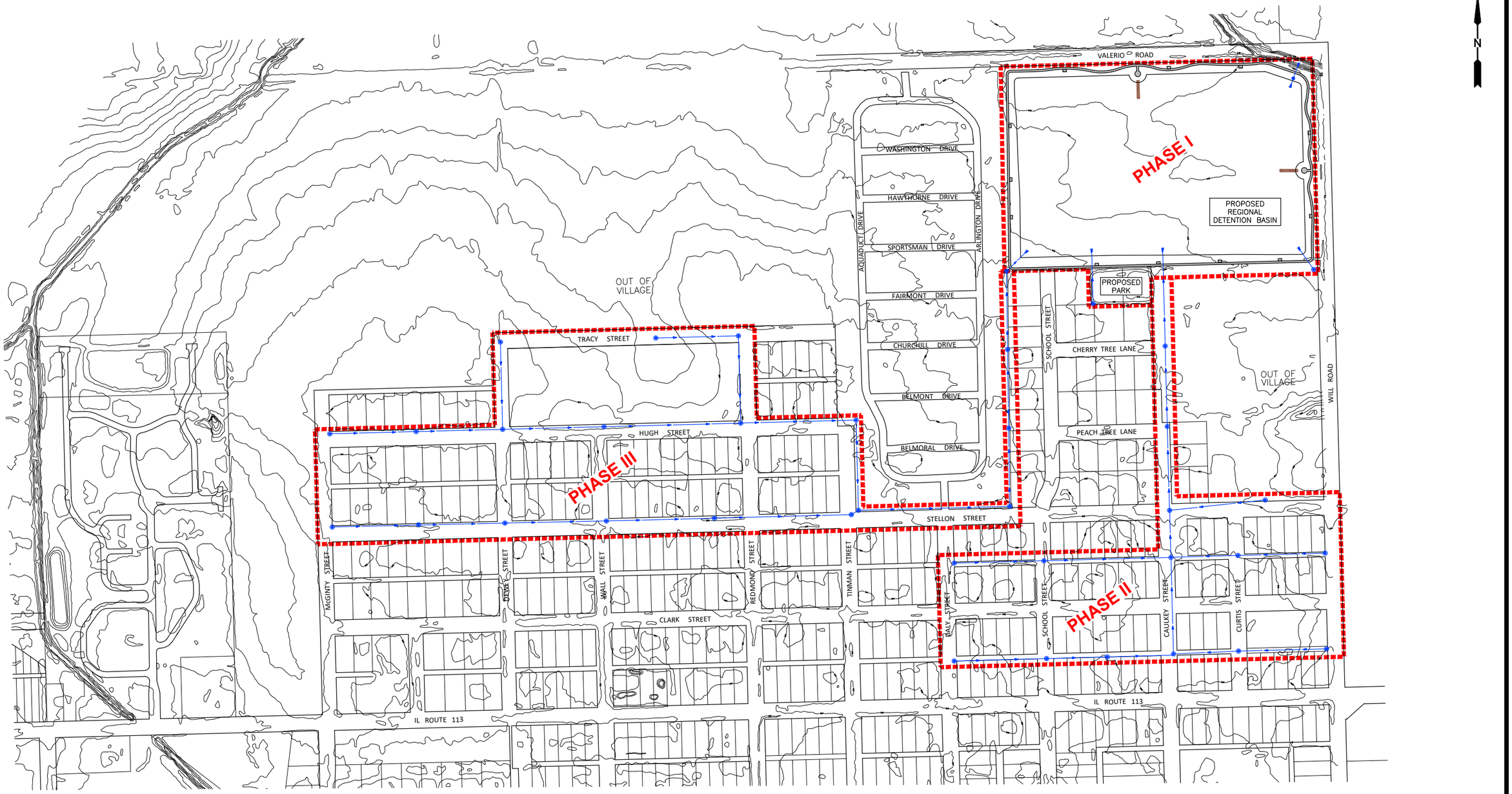
1. CRAWFORD BRIAN
   ZONED R4
2. HOEHN STEPHEN & RUTH
   ZONED R4
3. ELLIS JOHN & DONNAL
   ZONED R–4
4. G&P PROPERTIES INC
   ZONED R–4
5. BARRY & SHERRY BERTA
   ZONED RS–1 (COAL CITY)

JOSEPH & GEORGENE VAN DUYNE
10.00 ACRES
ZONED AGRICULTURAL (GRUNDY COUNTY)

DRAWN BY: TRH	Chamlin & Associates Peru • Morris • Ottawa • Mendota www.chamlin.com	**VILLAGE OF DIAMOND NORTHSIDE STORMWATER MANAGEMENT PLAN**	**ADJACENT PROPERTY OWNERS**	CURRENT AS OF: 10/13/21
CHECKED BY: MWP				JOB NO.: 15465.00 / SHEET 1
SCALE: 1"= 150'				FILE NO.: 15465.00 / OF 1

Chamlin and Assoc., Inc.

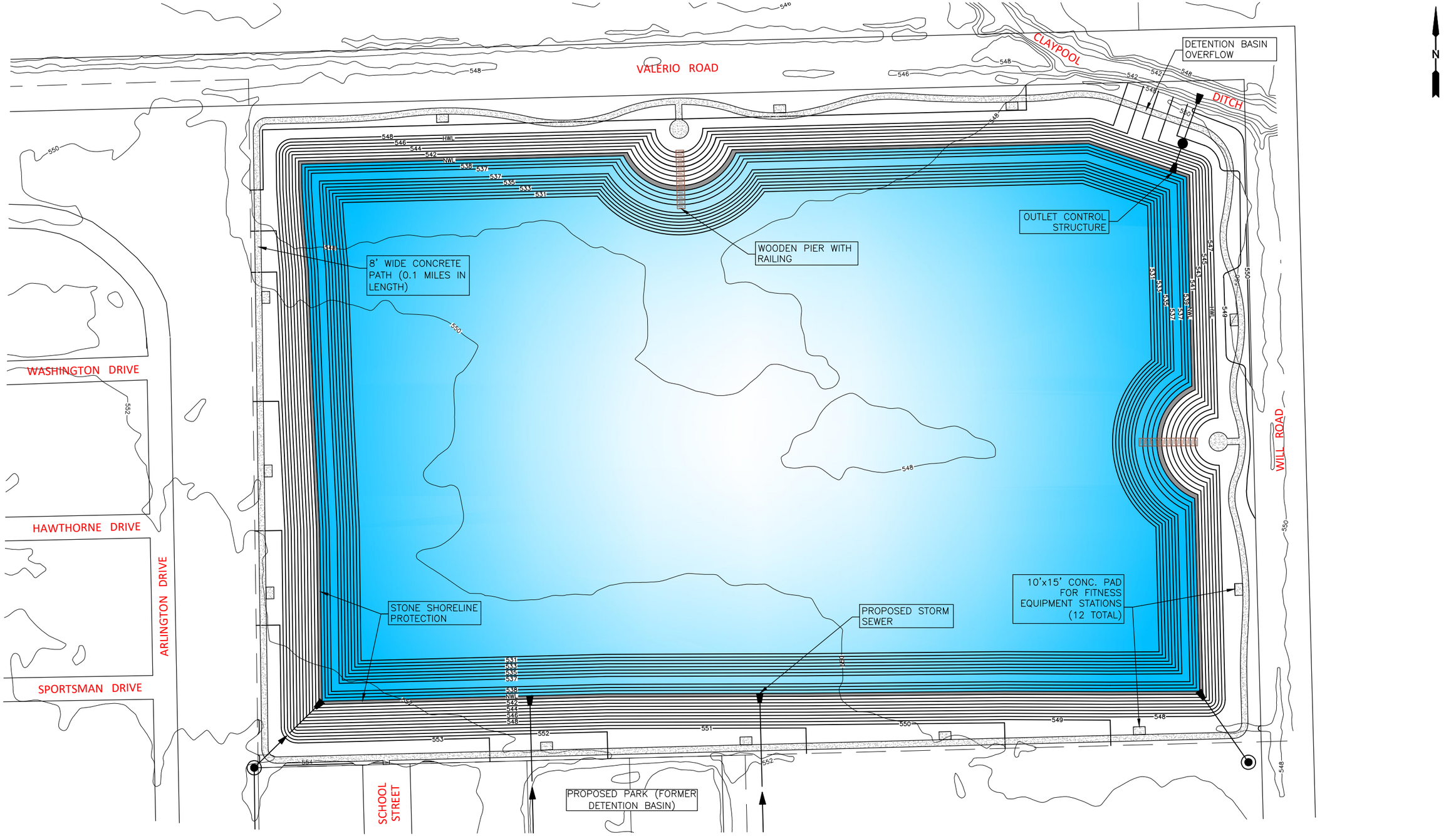
Appendix C
Phasing Exhibit



DRAWN BY: TRH	Chamlin & Associates Peru • Morris • Ottawa • Mendota www.chamlin.com	**VILLAGE OF DIAMOND NORTHSIDE STORMWATER MANAGEMENT PLAN**	**PHASING EXHIBIT**	CURRENT AS OF: 10/13/21
CHECKED BY: MWP				JOB NO.: 15465.00 — SHEET 1
SCALE: 1"= 400'				FILE NO.: 15465.00 — OF 1

Chamlin and Assoc., Inc.

Appendix D
Regional Stormwater Detention Basin



DRAWN BY: TRH	Chamlin & Associates Peru • Morris • Ottawa • Mendota www.chamlin.com	**VILLAGE OF DIAMOND NORTHSIDE STORMWATER MANAGEMENT PLAN**	**REGIONAL STORMWATER DETENTION BASIN**	CURRENT AS OF: 10/13/21
CHECKED BY: MWP				JOB NO.: 15465.00 — SHEET 1
SCALE: 1"= 120'				FILE NO.: 15465.00 — OF 1

Chamlin and Assoc., Inc.

Appendix E
Engineer's Estimate of Cost

Engineer's Estimate Of Cost

Estimate No. 1 Date November 10, 2021

Summary By TRH Prices By TRH Checked By MWP

Client Village of Diamond

Project Northside Drainage Study
Phase One

NO.	ITEMS	QTY.	UNIT	UNIT PRICE	COST
1	EARTHWORK EXCAVATION & HAUL OFF	447314	CY	$6.50	$ 2,907,541.00
2	TOPSOIL RESPREAD	4508	CY	$4.00	$ 18,032.00
3	RR6 RIP RAP	3394	SY	$50.00	$ 169,700.00
4	5" CONC. PATH W/ 4" AGG BASE	25275	SF	$8.00	$ 202,200.00
6	DEWATERING	1	LS	$20,000.00	$ 20,000.00
7	SEEDING, FERTILIZER & MULCH	5.59	AC	$6,000.00	$ 33,540.00
8	24" RCP W/ BEDDING & BACKFILL	322	LF	$35.00	$ 11,270.00
9	30" RCP W/ BEDDING & BACKFILL	93	LF	$40.00	$ 3,720.00
10	54" RCP W/ BEDDING & BACKFILL	182	LF	$65.00	$ 11,830.00
11	24" RCP FES	2	EA	$1,000.00	$ 2,000.00
12	30" RCP FES	2	EA	$1,500.00	$ 3,000.00
13	54" RCP FES	2	EA	$3,000.00	$ 6,000.00
14	5' DIA. MANHOLE W/ FRAME & GRATE	2	EA	$3,000.00	$ 6,000.00
15	7' DIA. MANHOLE W/ FRAME & GRATE	1	EA	$6,000.00	$ 6,000.00
16	6' DIA. OUTLET CONTROL STRUCTURE	1	EA	$8,000.00	$ 8,000.00
17	WOODEN PIER	2	EA	$6,000.00	$ 12,000.00
18	AERATORS	3	EA	$5,000.00	$ 15,000.00
19	FITNESS EQUIPMENT	12	EA	$3,000.00	$ 36,000.00
20	LANDSCAPING	1	LS	$15,000.00	$ 15,000.00
21	PARK SITE WORK	1	LS	$45,000.00	$ 45,000.00
22	PARK PLAYGROUND EQUIPMENT	1	LS	$60,000.00	$ 60,000.00
23	EROSION CONTROL	1	LS	$20,000.00	$ 20,000.00
	LAND ACQUISITION	26.88	AC	$25,000.00	$ 672,000.00
	GRANT ADMINISTRATION	1	LS	$60,000.00	$ 60,000.00
	PRELIMINARY ENGINEERING	1	LS	$42,257.52	$ 42,257.52
	GEOTECHNICAL ENGINEERING	1	LS	$8,000.00	$ 8,000.00
	CONSTRUCTION ENGINEERING	1	LS	$35,214.60	$ 35,214.60
	SUBTOTAL				$ 4,429,305.12
	CONTINGENCY (10%)				$ 442,930.51
TOTAL					**$ 4,872,235.63**

By Tim Hejny

Dated November 10, 2021

Chamlin & Associates

Peru, Morris, Ottawa, Mendota
Illinois

Remarks:

This estimate is based on conceptual plans. Quantities and unit costs are subject to change based on final engineering.

Project #: 15465.00

Engineer's Estimate Of Cost

Client: Village of Diamond

Estimate No. 1 Date November 10, 2021

Project: Northside Drainage Study
Phase Two

Summary By TRH Prices By TRH Checked By MWP

NO.	ITEMS	QTY.	UNIT	UNIT PRICE	COST
1	EROSION CONTROL	1	LS	$25,000.00	$ 25,000.00
2	15" RCP W/ BEDDING & BACKFILL	378	LF	$20.00	$ 7,560.00
3	18" RCP W/ BEDDING & BACKFILL	1385	LF	$25.00	$ 34,625.00
4	21" RCP W/ BEDDING & BACKFILL	249	LF	$30.00	$ 7,470.00
6	24" RCP W/ BEDDING & BACKFILL	633	LF	$35.00	$ 22,155.00
7	30" RCP W/ BEDDING & BACKFILL	791	LF	$40.00	$ 31,640.00
8	36" RCP W/ BEDDING & BACKFILL	396	LF	$45.00	$ 17,820.00
9	42" RCP W/ BEDDING & BACKFILL	193	LF	$50.00	$ 9,650.00
10	48" RCP W/ BEDDING & BACKFILL	343	LF	$55.00	$ 18,865.00
11	54" RCP W/ BEDDING & BACKFILL	651	LF	$65.00	$ 42,315.00
12	INLET TYPE B W/ FRAME & GRATE	2	EA	$3,000.00	$ 6,000.00
13	4' DIA. MANHOLE W/ FRAME & GRATE	8	EA	$5,000.00	$ 40,000.00
14	6' DIA. MANHOLE W/ FRAME & GRATE	4	EA	$6,500.00	$ 26,000.00
15	7' DIA. MANHOLE W/ FRAME & GRATE	1	EA	$8,000.00	$ 8,000.00
16	DRIVEWAY REMOVAL & REPLACEMENT	12	EA	$2,500.00	$ 30,000.00
17	SIDEWALK REMOVAL & REPLACEMENT	150	SY	$8.00	$ 1,200.00
18	CLASS D PATCH, TYPE IV	2155	SY	$35.00	$ 75,425.00
19	TREE REMOVAL	1	LS	$5,000.00	$ 5,000.00
20	UTILITY CROSSINGS	12	EA	$4,000.00	$ 48,000.00
21	RESTORATION	1	LS	$30,000.00	$ 30,000.00
	GRANT ADMINISTRATION	1	LS	$30,000.00	$ 30,000.00
	PRELIMINARY ENGINEERING	1	LS	$29,203.50	$ 29,203.50
	CONSTRUCTION ENGINEERING	1	LS	$24,336.25	$ 24,336.25
	SUBTOTAL				$ 570,264.75
	CONTINGENCY (10%)				$ 57,026.48
TOTAL					**$ 627,291.23**

By Tim Hejny

Dated November 10, 2021

Chamlin & Associates

Peru, Morris, Ottawa, Mendota
Illinois

Remarks:

This estimate is based on conceptual plans. Quantities and unit costs are subject to change based on final engineering.

Project #: 15465.00

Engineer's Estimate Of Cost

Estimate No. 1 Date November 10, 2021

Summary By TRH Prices By TRH Checked By MWP

Client Village of Diamond

Project Northside Drainage Study
Phase Three

NO.	ITEMS	QTY.	UNIT	UNIT PRICE	COST
1	EROSION CONTROL	1	LS	$25,000.00	$ 25,000.00
2	15" RCP W/ BEDDING & BACKFILL	358	LF	$20.00	$ 7,160.00
3	18" RCP W/ BEDDING & BACKFILL	1752	LF	$25.00	$ 43,800.00
4	21" RCP W/ BEDDING & BACKFILL	773	LF	$30.00	$ 23,190.00
6	24" RCP W/ BEDDING & BACKFILL	415	LF	$35.00	$ 14,525.00
7	30" RCP W/ BEDDING & BACKFILL	1596	LF	$40.00	$ 63,840.00
8	36" RCP W/ BEDDING & BACKFILL	844	LF	$45.00	$ 37,980.00
9	42" RCP W/ BEDDING & BACKFILL	940	LF	$50.00	$ 47,000.00
10	48" RCP W/ BEDDING & BACKFILL	323	LF	$55.00	$ 17,765.00
11	54" RCP W/ BEDDING & BACKFILL	440	LF	$65.00	$ 28,600.00
12	INLET TYPE B W/ FRAME & GRATE	6	EA	$3,000.00	$ 18,000.00
13	4' DIA. MANHOLE W/ FRAME & GRATE	6	EA	$5,000.00	$ 30,000.00
14	5' DIA. MANHOLE W/ FRAME & GRATE	1	EA	$6,000.00	$ 6,000.00
15	6' DIA. MANHOLE W/ FRAME & GRATE	1	EA	$6,500.00	$ 6,500.00
16	7' DIA. MANHOLE W/ FRAME & GRATE	3	EA	$8,000.00	$ 24,000.00
17	8' DIA. MANHOLE W/ FRAME & GRATE	2	EA	$9,500.00	$ 19,000.00
18	DRIVEWAY REMOVAL & REPLACEMENT	28	EA	$2,500.00	$ 70,000.00
19	SIDEWALK REMOVAL & REPLACEMENT	622	SY	$8.00	$ 4,976.00
20	CLASS D PATCH, TYPE IV	220	SY	$35.00	$ 7,700.00
21	TREE REMOVAL	1	LS	$5,000.00	$ 5,000.00
22	UTILITY CROSSINGS	8	EA	$4,000.00	$ 32,000.00
23	RESTORATION	1	LS	$45,000.00	$ 45,000.00
	GRANT ADMINISTRATION	1	LS	$30,000.00	$ 30,000.00
	PRELIMINARY ENGINEERING	1	LS	$31,922.16	$ 31,922.16
	CONSTRUCTION ENGINEERING	1	LS	$26,601.80	$ 26,601.80
	SUBTOTAL				$ 665,559.96
	CONTINGENCY (10%)				$ 66,556.00
TOTAL					**$ 732,115.96**

By Tim Hejny

Dated November 10, 2021

Chamlin & Associates

Peru, Morris, Ottawa, Mendota
Illinois

Remarks:

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Project #: 15465.00