

ROADWAY ASSESSMENT REPORT

FOR THE

VILLAGE OF HASTINGS-ON-HUDSON
PUBLIC WORKS DEPARTMENT

PREPARED BY

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EXECUTIVE SUMMARY

This comprehensive roadway assessment report was completed for the Village of Hastings-on-Hudson specifically to be used by the Department of Public Works to develop a multi-year rehabilitation plan. This report provides general roadway information, roadway maintenance information, a road classification system, field evaluation procedures, a comprehensive plan including a sequencing strategy and a sequencing plan, and recommendations for the Village staff to use for future assessments.

The Village has 145 separate roadways that they maintain which have been evaluated for this report. A classification system has been developed based on the system used by the NYSDOT, which has been modified to meet the needs of the Village. Each roadway was evaluated on its usage, ride quality, and distress. The evaluation criteria provides a rating method that allows the roadways to be scored on a scale of 0 to 10, and subsequently ranked in order of lowest to highest. The higher the road score value, the better the condition of the road. The goal was to create a system that will make evaluating each roadway consistent between employees. Overall the conditions of the roadways were good with the majority of the roadways scoring above a 5.

Following the ranking of the entire list of roadways, a multi-year comprehensive rehabilitation plan was created to give the Village's Department of Public Works a sequence strategy and sequencing plan. The goal of the sequencing strategy and sequencing plan is to bring all the roadways within the Village up to an average score of an 8. This can be accomplished by the comprehensive plan outlined in this report. This includes a yearly plan to mill and pave, which lists the roadways that are in need of repair along with the cost associated to resurface each roadway. Based on the Village's annual budget of \$200,000, a list of roads to be repaired on an annual basis has been developed and is listed in Appendix J. This plan has been extended for a 10 year period and includes approximately 4 to 6 roadways per year that can be re-surfaced.

The cost provided in this report are to mill and pave the roadways. Additional costs for curbs, striping, or other improvements are to be determined separately. To assist with determining these costs, an annual checklist is provided in Appendix H.

INTRODUCTION

James J. Hahn Engineering, P.C., was awarded the task of assessing the condition of all the roadways within the Village of Hastings-on-Hudson. This roadway assessment report includes developing a classification system and creating a multi-year comprehensive rehabilitation plan.

The classification system is based on the NYSDOT road evaluation system and has been customized to meet the Village's needs. The classification system includes a map of the Village's roadways, a list of all roadway names, identification numbers, lengths and average widths.

The multi-year comprehensive rehabilitation plan ranks and rates the roadways in the order which we recommend roadway re-surfacing. Recommendations and costs for the roadways that require the most work have been provided. The rating system is described in detail in this report and will be reviewed with Village staff so that future roadway evaluations can be conducted by the Village staff. A list of all the roadways with their corresponding rankings is included in Appendix A and B.

GENERAL ROADWAY INFORMATION

Asphalt roadways can last up to 30 years however durability decreases significantly after about 20 years. The lifespan is directly related to its construction, foundation, climate, and traffic. Depending on these factors a roadway may only last a few years.

Roadways consist of various elements including the surface type, subbase materials, cross slope, crown, width, shoulders, curbs, and drainage. This section of the report will briefly discuss the general elements of typical roadways, and which were used in our evaluation.

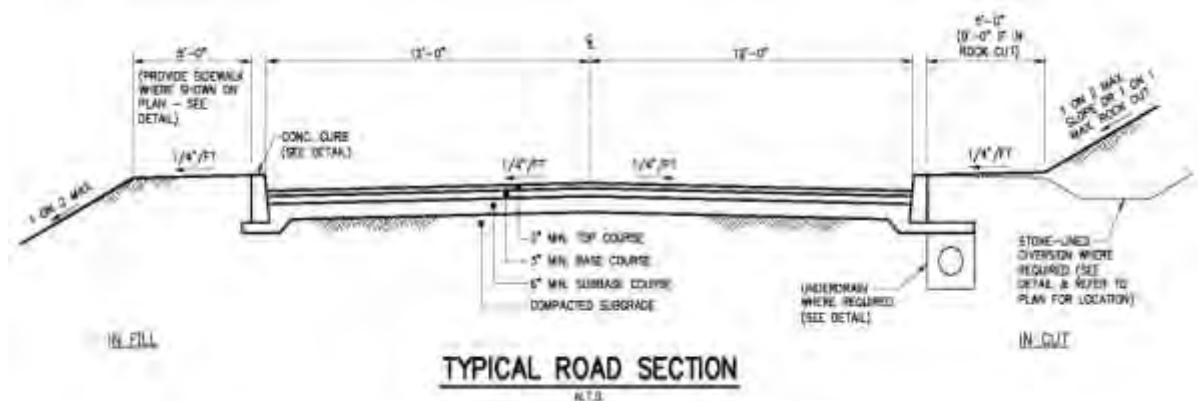
Surface types are either rigid or flexible. Concrete roads are considered rigid; asphalt roads or concrete roads with an asphalt overlay are considered flexible. Road surface material is typically selected based on traffic volume, soil characteristics, weather, initial cost, overall annual maintenance and service-life cost. All of the Village roads are asphalt which is typical for areas that experience extreme climate changes. Due to the age and history of the communities along the Hudson River, it is not uncommon to find cobble or other types of material below the existing roadway. In some cases unsuitable material below the roadway causes failure of the roadway.

The width of a roadway is important since it influences the safety and comfort of driving. The road width includes the lane as well as the shoulders. Lane widths generally vary between 9 to 12 feet. Most of the Village's lanes were found to be approximately 9 feet wide. Roadway shoulders also vary in width and can vary from a few inches to 9 feet. The shoulder provides an area for vehicles to stop, use in emergencies, and for lateral support of the subbase material.

Curbs are a raised or vertical element that are typically constructed of concrete, asphalt, or stone and are an important part of a roadway system. Curbs provide drainage control, roadway edge delineation, aesthetics, delineation of pedestrian walkways and can reduce maintenance

operations. The standard height of a curb should be 4 to 6 inches. The majority of the roadways have a curb of some type.

A working drainage system is important to maintaining a safe roadway. Drainage design should incorporate safety, good appearance, control pollutants and be economical to maintain. Drainage systems are either open or closed systems. In an open system, the runoff is conveyed in a swale or open gutter, where a closed system is piped. The majority of roadways in the Village use a closed drainage system or combination of the two.



The detail above is a typical cross section of a road that includes curbs, asphalt surface, subbase material and an under drain. The typical cross pitch is $\frac{1}{4}$ inch per foot. The crown of the roadway is at the center line where water pitches to either side. An underdrain may be used when there is a high groundwater table or excessive runoff from an uphill slope.

MAINTENANCE OF ROADWAYS

Proper road maintenance improves ease of transportation and reduces costs for the Village. An improperly maintained road could also lead to an increased number of accidents. This assessment and report was developed for the Village staff to evaluate periodic repairs for the roadways.

Roadways can display various types of distress, including cracking, delamination, raveling, patching, sealing, rutting, and more. Descriptions and photographs of various types of distresses are shown in Appendix C.

Periodic repairs should be performed as needed to preserve the structural integrity of the road. Roadway repair work can be grouped into categories that include preventative measures, surface overlay, re-surfacing, and pavement reconstruction.

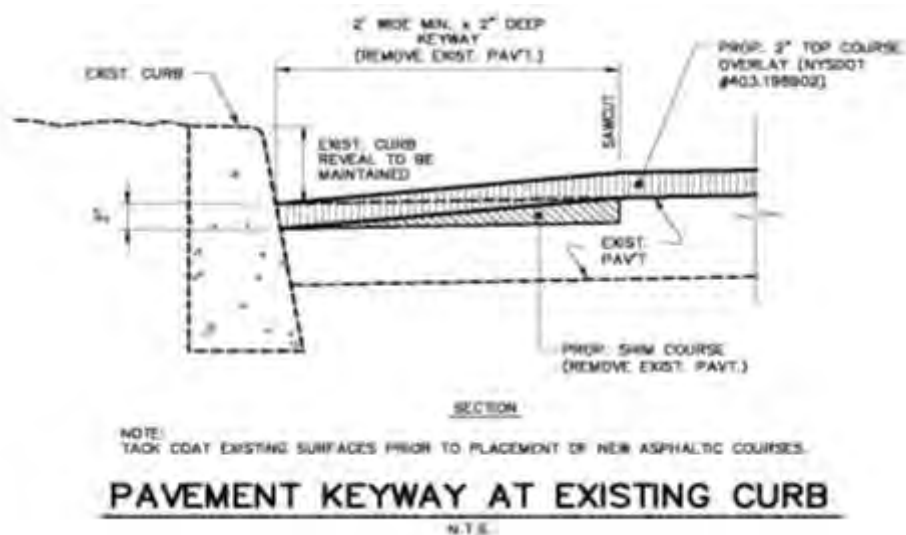
Preventative measures are minor repairs which include joint and crack sealing, temporary and permanent patching, other miscellaneous paving, drainage improvements, or curb installation.

Pavement overlay work consists of paving over the existing roadway to cover cracks, fill potholes and increase the strength of the roadway. Various items should be reviewed prior to placing an overlay on a road, including curb reveal and structures that may need adjusting (valve

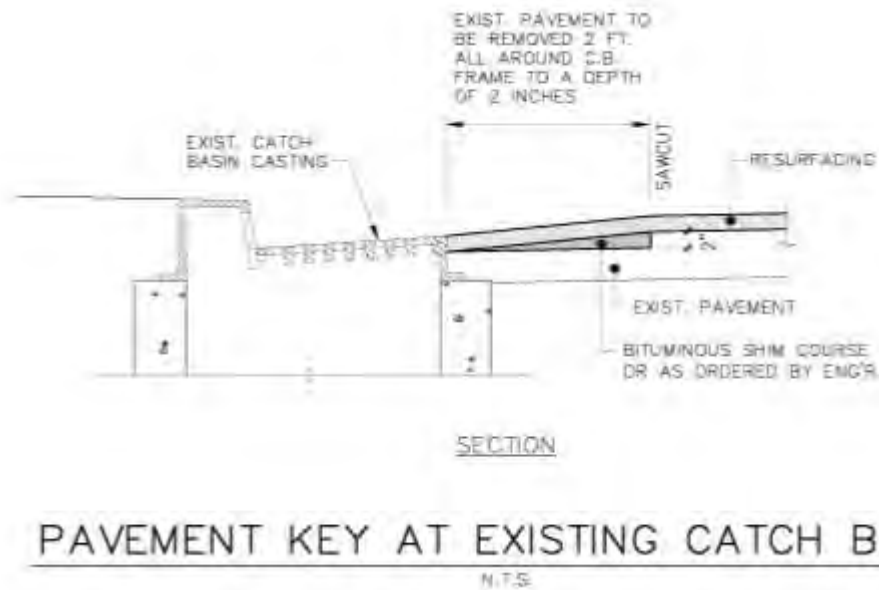
boxes, catch basins, manholes, etc.). The pavement along the curb will need to be removed prior to paving, if the curb reveal is limited.

Re-surfacing work includes removing the existing pavement (milling), generally between 1 ½ and 2 inches, then paving the area that was milled. Ideally no additional work is required (such as adjusting valve boxes or manholes), since the existing grade is usually the same. However frequent adjustments may be required, which should be verified prior to bidding any road improvements.

Pavement reconstruction may be needed when the structural integrity of the road is compromised. Prior to reconstructing the roadway, an engineer should determine the extent of work required.



The detail above is a typical cross section of a pavement keyway used to maintain proper curb reveal during pavement overlaying.



The pavement keyway detail above is typical for maintaining the proper catch basin reveal during pavement overlaying.

It is important to track the maintenance of a roadway. Some roads need to be resurfaced, or repaired, more frequently than others, which may be due to an underlining issue.

CLASSIFICATION SYSTEM

The classification system in this report has been derived from the NYSDOT classification system and refined to meet the needs of the Village.

The classification system consists of an evaluation procedure, roadway map, and road inventory list. A Field Evaluation Form (Appendix D) was created to analyze the roadways, calculate a road rating, and to compare roads to one another in the Village.

The roadway map identifies which roads are owned by the Village, the State, the County, or privately owned. It also includes dimensional information including length, width, and area.

The Field Evaluation Form is used to record information known about each roadway, record details of each evaluation, and rate each roadway.

To classify the roadways, a roadway map, list of roadways, and evaluation procedure was developed. The roadway map identifies all the roadways the Village maintains and identifies the usage, which is described later in this section. The roadway list provides information on the roadways including the length, width, and asphalt tonnage. The field evaluation form provides information on the roadway features, usage, ride quality, pavement distress, and overall rating.

This section of the report describes the evaluation procedure, rating methods, and rating calculations.

Field Evaluation Procedure

The steps used to evaluate each roadway in the field are as follows:

- 1) Drive the length of each roadway at the posted speed limit to assess the ride quality and identify general areas of distress.
- 2) Drive the length of the roadway slowly, noting each distress.
- 3) Photograph every 1,000 to 2,000 feet of road and recording areas showing significant signs of distress.
- 4) Record data on Field Evaluation Form. Complete and score roadway in the field.

Each roadway pavement evaluation form should detail the roadway attributes and condition. Sample forms have been included in Appendix D. The first section describes all the main details of roadway. The subsequent sections have been used to determine the overall rating of each road. These sections are listed below in more detail.

A roadway inventory map has been created, which lists the roadways with their name, ID#, length, average width and area. Field evaluation forms are used to rate each roadway based on three types of criteria, usage, ride quality and distress. This system will then be used to evaluate each roadway annually and assess the condition of each roadway and the need for repair.

Rating Methods

The rating methods used for each individual roadways will evaluate the usage, ride quality, and visible signs of distress. It is important to conduct the evaluations of a roadway prior to ground frost which may intensify the distress that is visible.

I. Usage Rating

The usage rating is determined by the amount of traffic, or use, a roadway experiences. This is categorized as either low, medium, or high. A low usage road is typically a road that does not have an outlet, or connects to a few homes. A high usage road experiences the most traffic and use. It typically includes main roads, roads that share traffic with state or county roads, or roads that connect to populated or popular areas. A medium usage road connects the high usage roads to the low usage roads. The amount of use is important in ranking the roadways, since a more traveled roadway will impact more people. In addition, a roadway with less use should require less maintenance.

Higher use roads have the lowest assigned value in the ranking system. The scoring used is as follows: 10 for low usage, 5 for medium usage, and 0 for high usage. A roadway map has been attached to this report.

II. Ride Quality Rating

This section uses three parameters to rate the ride quality, which are listed on the field evaluation form and described below.

The main parameter is the overall ride quality, which is determined by the driver during step 1 of the evaluation procedure. This assessment is conducted while driving over each road at the posted speed limit and noting the “seat feel” of the ride. The scores range from a low of 2 and high of 10.

The second parameter is determining the presence of corrugations in the road, which is defined as a series of closely spaced ridges and valleys (ripples) occurring at fairly regular intervals, usually less than 10’ along the pavement. The ridges are perpendicular to the traffic direction. This type of distress is usually caused by traffic action combined with an unstable pavement surface or base.

The last parameter is the presence of settlements or heaves, which is described as localized pavement surface areas having elevations slightly lower than surrounding pavement or localized upward displacements of the pavement surface.

Generally when assessing ride quality the Department of Transportation uses a high speed profiler system attached to their vehicles to rate the ride quality on a score from 1 being the worst to 100 being the best. For the purposes of this study due to certain limitations the ride quality will be assessed by the driver. It is important the field evaluations are consistent, therefore drivers should also be consistent.

III. Distress Rating

The distress rating is a score given that reflects the distress type, severity, and frequency of a roadway. Types of distress may vary depending if the pavement is flexible or rigid.

Flexible distresses include cracking, raveling, wheel path rutting, delamination, patching crack filling, and overlays. A description and photograph of these distresses is shown in Appendix E.

Rigid distresses include spalling, delamination, patching, settlements and heaves, blowups, joint failure, faulting, cracking, scaling, and rutting. A description and photographs of these distresses is shown in Appendix F.

The distress rating is determined in the field at the end of evaluating the roadway. The pavement rating charts in Appendix G are used to rate the roads based on frequency, severity, and appearance. The field evaluation form is completed and a score is determined.

CALCULATING THE RATING

The overall rating of each roadway is based on the scores that were determined for usage, ride quality, and distress. The scores are not equally weighted as shown below.

Distress:	65%
Ride Quality:	20%
Usage:	15%
Total:	100%

Distress measures the condition of the roadway and is the most important variable, therefore determines most of the overall rating. Ride quality is important and is dependent on the distress, however it is evaluated separately since a high ride quality is desirable for vehicles.

Usage is not directly related to the quality of the roadway; however the amount a road is used does affect the lifespan of the roadway. Usage is also important since higher traveled roadways affect more people. Therefore all conditions of a roadway being equal, a more used roadway should generally be re-paved before a low use roadway. It is important to note that a roadway identified as low usage can have a maximum rating of 10, medium usage road can have a maximum rating of 9.25, and a high usage road can have a maximum rating of 8.5.

FIELD EVALUATION

A field evaluation for the Village-owned roadways was performed in December 2015 and January 2016. The roads were ranked and listed in order from the lowest to the highest; the lowest being in the worst condition (Appendix B). It should be noted that Farragut Avenue was ranked one of the worst roadways; however the Village had mentioned that Con Edison is responsible to repave the entire roadway once their gas main work has been completed. Therefore, it is assumed that the road will be in excellent condition when the project is complete.

Ideally field evaluations should be performed annually, or at the least every few years. This will allow the Village to identify problematic areas fairly and possibly reduce the cost of repair or maintenance.

COMPREHENSIVE PLAN

A comprehensive plan is to improve the overall quality of all the roads in the Village cost effectively by developing a sequencing strategy and sequencing plan.

Sequencing Strategy

The recommended sequencing strategy is to improve the roads in the most need first. The goal is to increase each roadway's rating above an 8. Therefore in some cases, the entire road may not need to be resurfaced; it may only require a portion of the road be resurfaced to bring the overall rating of the roadway to an acceptable quality. For example, if a road is rated at 4, and resurfacing one-third of the road would bring the overall rating to an 8, there is no need to pave the

entire road. The savings on the portion of road not paved, can be used for other roads in the Village.

The roadways with the lowest overall rating are the first roadways that are recommended to be resurfaced. The first roadways recommended to be resurfaced had an overall rating of 3 or 4, which are listed on a spreadsheet. The next roadways that are added to the list have an overall rating of 5. Since there are a numerous amount of these ratings, they have been grouped by location. Grouping roadways allows a contractor to work faster and may lead to a lower repair cost. The roadways with an overall rating of 6 were added next, followed by 7 through 10.

An estimated cost to resurface each roadway based on the area of the roads was calculated and was added to the spreadsheet. The cost to resurface the grouped sets of roadways was calculated and if the group exceeded the Village's annual budget of \$200,000, some of the roads were placed in the following year. The groups were reevaluated until the cost was approximately within 10 percent of the annual budget. A summary sheet of the road sequence has been provided in Appendix J.

It is important to note that numerous roadways have overall ratings that vary only slightly, and that the logistics of the roadway paving should be considered. In this case, the features that should be considered are the need for additional drainage, utility projects, or other projects that may impact a roadway. If a utility project will be completed in a few years, the Village may consider waiting to re-surface the roadway.

It is also important to note that the costs to re-surface each roadway does not include miscellaneous items such as pavement markings, curbs, or other items that should be reviewed prior to finalizing the budget. These items are included on the annual check list provided in Appendix H.

Sequencing Plan

The sequencing plan is the order in which the roadways are re-surfaced. As described above, they are grouped according to cumulative cost and logistical location. The estimated cost of re-surfacing each road is calculated, and a cumulative cost is totaled, as shown in Appendix I. As the estimate shows, to re-surface all of the roadways in the Village would cost approximately \$6.7 million. Using a budget of \$200,000 per year, it would take approximately 34 years to re-surface all of the roads in the Village (using present worth value).

The phasing plan provided in this report should not be assumed as final, or exact. It provides a basis for the Village to understand which roadways we considered most in need of repair. The entire recommended sequencing plan is provided in Appendix J. A summary of the first five (5) years is shown below, and a map showing these roads is attached.

STREET NAME	LENGTH (FT)	AREA (SY)	OVERALL RATING	COST MILL AND PAVE (\$117/ton, \$5.50/SY)
2016				
DERRY LN (EAST)	425	708	3	\$13,104
ASHLEY RD	851	1702	4	\$31,487
ROSE ST	1181	3149	4	\$58,263
GREEN ST	510	1133	5	\$20,967
BRANFORD RD	1200	2933	5	\$54,267
HUDSON ST (EAST)	325	1083	5	\$20,042
Total				\$198,129
2017				
WILLIAM ST	414	1150	4	\$21,275
AQUEDUCT LN	838	1490	5	\$27,561
WASHINGTON AVE*	1500	5000	5	\$92,500
RIDGEDELL AVE	193	429	5	\$7,934
RIVER ST**	600	3000	5	\$55,500
				\$204,770
2018				
RIVER ST**	906	4530	5	\$83,805
CHAUNCEY LN*	400	1067	5	\$19,733
HILLSIDE AVE	1287	4290	5	\$79,365
CROTON AVE	594	1782	5	\$32,967
				\$215,870
2019				
BRANDT ST	457	1219	5	\$22,545
FULTON ST	539	1318	5	\$24,375
CROSSBAR RD	1431	4770	5	\$88,245
CEDARS STREET	942	2093	5	\$38,727
RONNY CIR	677	1504	5	\$27,832
				\$201,724
2020				
COCHRANE AVE	1653	4408	5	\$81,548
CLARENCE AVE	380	929	5	\$17,184
STANLEY AVE (NORTH)	621	2070	5	\$38,295
STANLEY AVE (SOUTH)	1591	3536	5	\$65,408
				\$202,435

The quantities provided in this report must be verified prior to bid. Miscellaneous items such as pavement markings, curbs, adjusting manholes, adjusting valves, or other are not included in

these costs. Some roadway lengths shown above do not reflect the entire roadway, only the section in need of repair. The roadways have been identified in Appendix J.

It appears that a majority of the curbs on the lowest ranking roadways are in need of replacement. There are also some sidewalks that will need to be replaced. The sidewalk at William Street should be replaced before or simultaneously with resurfacing the roadway. In addition, the parking lot at the south end of Rose Street should be resurfaced.

The sequencing of years 2016 and 2017 were chosen as the first 2 years since they had the lowest rankings. Years 2018 through 2022 had similar rankings and are therefore interchangeable.

RECOMMENDATIONS

Based on our field evaluations and cost analysis, we recommend using the strategy and plan described in this report. The annual cost should be re-evaluated by the Village. James J. Hahn Engineering would work with the Village to further customize the road re-surfacing plan based on specific concerns the Village.

We also recommend identifying any work needed to be completed before a road is resurfaced. Therefore the work can be scheduled and completed prior to paving.

CONCLUSION

This roadway classification report and assessment for The Village of Hastings-on-Hudson was conducted to be used by the Public Works Department as a tool to quantify the various states of condition that each roadway is in within the village. The Village staff will be able to use the methods explained in this report in the future to conduct roadway assessments on their own and develop an ongoing multiyear comprehensive plan. Additionally any existing records that the Village has on file regarding past roadway resurfacing projects will improve future assessments. For example if a roadway was recently repaved but already showing signs of deterioration further investigation should be conducted, such as evaluating the subbase for replacement rather than simply milling and repaving a roadway.

APPENDICES

A –ROADWAY LIST

**LIST OF ROADWAYS
VILLAGE OF HASTINGS-ON-HUDSON**

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	DATE RESURFACED	NOTES
AMHERST DR	1	1710	30	51300	5700		
AQUEDUCT LN	2	838	16	13408	1490		
ASHLEY RD	3	851	18	15318	1702		
BAKER LN (LOOP)	4	500	16	8000	889		
BELLAIR DR	5	178	18	3204	356		
BEVERS ST	6	240	24	5760	640		
BRANDT ST	7	457	24	10968	1219		
BRANFORD RD	8	1200	22	26400	2933		
BUENA VISTA DR	9	827	20	16540	1838		
BURKELY PL	10	181	13	2353	261		
BURNSIDE DR (EAST)	11	155	20	3100	344		
BURNSIDE DR (WEST)	12	1202	20	24040	2671		
BURNSIDE PL	13	391	20	7820	869		
CALUMET AVE	14	967	30	29010	3223		
CEDARS STREET	15	942	20	18840	2093		
CHAUNCEY LN	16	1212	24	29088	3232		Repave first 400' to improve road
CHEMKA POOL RD	17	542	22	11924	1325		
CHESTNUT DR	18	808	20	16160	1796		
CIRCLE DR	19	2000	20	40000	4444		
CLARENCE AVE	20	380	22	8360	929		
CLIFF ST	21	1429	18	25722	2858		
CLINTON AVE	22	692	22	15224	1692		
CLUNIE AVE	23	550	22	12100	1344		
COCHRANE AVE	24	1653	24	39672	4408		
COLUMBIA AVE	25	427	27	11529	1281		
CROPSEY LN	26	769	19	14611	1623		
CROSSBAR RD	27	1431	30	42930	4770		
CROTON AVE	28	594	27	16038	1782		
CURRY RD	29	620	20	12400	1378		
DARWIN AVE	30	595	30	17850	1983		
DASSERN DR	31	2274	14	31836	3537		Private
DAVID LN	32	159	26	4134	459		Private
DERRY LN (EAST)	33	425	15	6375	708		
DERRY LN (WEST)	34	237	15	3555	395		
DEVON WAY	35	553	20	11060	1229		
DIVISION ST	36	300	18	5400	600		
DORCHESTER AVE	37	1095	20	21900	2433		
DUDLEY ST	38	866	24	20784	2309		Private
EDGARS LN	39	2214	26	57564	6396		
EDGEWOOD AVE	40	1056	25	26400	2933		
EDISON AVE	41	195	24	4680	520		
EDMARTH PL	42	192	20	3840	427		
EUCLID AVE	43	1925	30	57750	6417		
FAIRMONT AVE	44	2162	22	47564	5285		
FARLANE DR	45	965	20	19300	2144		
FARRAGUT AVE	46	2220	24	53280	5920		Con-Ed will pave after gas main is installed
FENWICK RD	47	765	20	15300	1700		
FERNDAL DR	48	1215	20	24300	2700		
FLORAL DR	49	622	20	12440	1382		
FLOWER AVE	50	1285	20	25700	2856		
FOREST AVE	51	690	20	13800	1533		
FRASER PL	52	1298	23	29854	3317		
FULTON ST	53	539	22	11858	1318		
GARLAND DR	54	523	15	7845	872		
GLENN PL	55	584	30	17520	1947		
GLENWOOD AVE	56	415	22	9130	1014		

**LIST OF ROADWAYS
VILLAGE OF HASTINGS-ON-HUDSON**

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	DATE RESURFACED	NOTES
GOODWIN ST	57	707	30	21210	2357		
GREEN ST	58	510	20	10200	1133		
HALL PL	59	147	26	3822	425		
HAMILTON AVE	60	1662	25	41550	4617		
HARVARD LN	61	820	30	24600	2733		
HASTINGS LNDG	62	1190	20	23800	2644		Private
HIGH ST	63	3257	26	84682	9409		
HILLSIDE AVE	64	1287	30	38610	4290		
HOLLY PL	65	475	24	11400	1267		
HOLLYWOOD DR	66	1217	18	21906	2434		
HOPKE AVE	67	491	26	12766	1418		
HORNER AVE	68	685	22	15070	1674		
HUDSON ST (EAST)	69	325	30	9750	1083		
HUDSON ST (WEST)	70	700	25	17500	1944		
JAMES ST	71	2060	22	45320	5036		
JEFFERSON AVE	72	1070	22	23540	2616		
JORDAN RD	73	1624	30	48720	5413		
KENT AVE	74	1524	24	36576	4064		
LEFURGY AVE	75	1721	26	44746	4972		
LEFURGY TER	76	167	18	3006	334		
LINCOLN AVE	77	2515	24	60360	6707		
MAGNOLIA DR	78	44	30	1320	147		
MAIN ST	79	1212	40	48480	5387		
MAPLE AVE	80	1408	40	56320	6258		
MAPLE LANE	81	200	15	3000	333		Gravel
MARBLE TER	82	244	20	4880	542		
MARIANA DR	83	781	30	23430	2603		
MARION AVE	84	264	26	6864	763		
MERRILL ST	85	386	28	10808	1201		
MINTURN ST	86	832	25	20800	2311		
MT HOPE BLVD	87	4580	34	155720	17302		
N END PL (EAST)	88	245	20	4900	544		
N END PL (WEST)	89	230	24	5520	613		
NEPERA PL	90	614	22	13508	1501		
NEPPERHAN AVE	91	580	23	13340	1482		
NICHOLS DR	92	545	20	10900	1211		
NORTH ST	93	249	30	7470	830		
OAKDALE DR	94	612	19	11628	1292		
OLINDA AVE	95	510	30	15300	1700		
OVERLOOK RD	96	2245	20	44900	4989		
OXFORD RD	97	941	30	28230	3137		
PALISADE AVE	98	69	30	2070	230		
PEARL ST	99	234	24	5616	624		
PINE ST	100	230	24	5520	613		
PINECREST DR	101	2048	22	45056	5006		
PINECREST PKY	102	1440	30	43200	4800		
PLEASANT AVE	103	359	28	10052	1117		
PRESCOTT PL	104	278	22	6116	680		
PRINCE ST	105	930	20	18600	2067		
RAVENSDALE RD	106	2776	28	77728	8636		
RAVINE DR	107	794	18	14292	1588		
RIDGE ST	108	542	24	13008	1445		
RIDGEDELL AVE	109	193	20	3860	429		
RIVER ST	110	1506	45	67770	7530		
RIVERPOINTE RD	111	748	24	17952	1995		Private
RIVERVIEW PL	112	427	24	10248	1139		

**LIST OF ROADWAYS
VILLAGE OF HASTINGS-ON-HUDSON**

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	DATE RESURFACED	NOTES
RONNY CIR	113	677	20	13540	1504		
ROSE ST	114	1181	24	28344	3149		
ROSEDALE AVE	115	2375	30	71250	7917		
S CALUMET AVE	116	610	30	18300	2033		
S CLINTON ST	117	994	21	20874	2319		
SAUNDERS ST	118	258	28	7224	803		
SCENIC DR	119	1399	20	27980	3109		
SCHOOL ST	120	490	30	14700	1633		
SHELDON PL	121	803	20	16060	1784		
SOUTH DR	122	576	20	11520	1280		
SOUTHGATE AVE	123	1905	22	41910	4657		
SOUTHLAWN AVE	124	108	32	3456	384		
SOUTHSIDE AVE	125	3578	25	89450	9939		
SPRING ST	126	265	38	10070	1119		
STANLEY AVE (NORTH)	127	621	30	18630	2070		
STANLEY AVE (SOUTH)	128	1591	20	31820	3536		
STRATFORD LN	129	524	20	10480	1164		
SUMMIT DR	130	1382	18	24876	2764		
SUMMIT ST	131	541	18	9738	1082		
SUNSET ST	132	217	22	4774	530		
TAFT ST	133	208	25	5200	578		
TERRACE AVE	134	660	20	13200	1467		
THE FENWAY	135	290	32	9280	1031		
TOMPKINS AVE	136	2204	30	66120	7347		
TRAVIS PL	137	305	25	7625	847		
VALLEY PL	138	429	26	11154	1239		
VILLARD AVE	139	3527	30	105810	11757		
W MAIN ST	140	285	30	8550	950		
WAGNER PL	141	377	26	9802	1089		
WARD ST	142	230	22	5060	562		
WARREN ST (EAST)	143	138	20	2760	307		
WARREN ST (WEST)	144	727	20	14540	1616		
WASHINGTON AVE	145	1780	30	53400	5933		
WHITMAN ST	146	952	24	22848	2539		
WILLIAM ST	147	414	25	10350	1150		
WILSON ST	148	220	25	5500	611		
WINDSOR RD	149	807	20	16140	1793		
YALE RD	150	255	30	7650	850		
ZINSSER WAY	151	367	24	8808	979		

TOTAL LENGTH (ft) 136835

TOTAL LENGTH (mi) 25.9

NOTES:

The length of roadway was taken at the center of the intersection when applicable. The areas provided are estimates and should be re-evaluated when necessary.

B – ROADWAY RANKING

ROADWAY RATING TABLE
VILLAGE OF HASTINGS-ON-HUDSON, NY

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	TOTAL	OVERALL RATING
DERRY LN (EAST)	33	425	15	6375	708	3.2	3
ASHLEY RD	3	851	18	15318	1702	3.875	4
ROSE ST	114	1181	24	28344	3149	4.15	4
WILLIAM ST	147	414	25	10350	1150	4.4	4
AQUEDUCT LN	2	838	16	13408	1490	4.8	5
CLIFF ST	21	1429	18	25722	2858	4.8	5
COCHRANE AVE	24	1653	24	39672	4408	4.8	5
HUDSON ST (EAST)	69	325	30	9750	1083	4.8	5
RIDGEDELL AVE	109	193	20	3860	429	4.9	5
CHAUNCEY LN	16	1212	24	29088	3232	5.1	5
CLARENCE AVE	20	380	22	8360	929	5.1	5
HILLSIDE AVE	64	1287	30	38610	4290	5.1	5
MT HOPE BLVD	87	4580	34	155720	17302	5.1	5
VALLEY PL	138	429	26	11154	1239	5.1	5
WASHINGTON AVE	145	1780	30	53400	5933	5.1	5
BELLAIR DR	5	178	18	3204	356	5.2	5
BRANDT ST	7	457	24	10968	1219	5.2	5
CEDARS STREET	15	942	20	18840	2093	5.2	5
CROSSBAR RD	27	1431	30	42930	4770	5.2	5
CROTON AVE	28	594	27	16038	1782	5.2	5
FARLANE DR	45	965	20	19300	2144	5.2	5
FULTON ST	53	539	22	11858	1318	5.2	5
GREEN ST	58	510	20	10200	1133	5.2	5
MARIANA DR	83	781	30	23430	2603	5.2	5
MINTURN ST	86	832	25	20800	2311	5.2	5
OLINDA AVE	95	510	30	15300	1700	5.2	5
RONNY CIR	113	677	20	13540	1504	5.2	5
SHELDON PL	121	803	20	16060	1784	5.2	5
SOUTH DR	122	576	20	11520	1280	5.2	5
SOUTHLAWN AVE	124	108	32	3456	384	5.2	5
STANLEY AVE (NORTH)	127	621	30	18630	2070	5.2	5
STANLEY AVE (SOUTH)	128	1591	20	31820	3536	5.2	5
RIVER ST	110	1506	45	67770	7530	5.35	5
BRANFORD RD	8	1200	22	26400	2933	5.45	5
EDMARTH PL	42	192	20	3840	427	5.55	6
PEARL ST	99	234	24	5616	624	5.55	6
TRAVIS PL	137	305	25	7625	847	5.55	6
CLUNIE AVE	23	550	22	12100	1344	5.6	6
COLUMBIA AVE	25	427	27	11529	1281	5.6	6
NEPERA PL	90	614	22	13508	1501	5.6	6
NEPPERHAN AVE	91	580	23	13340	1482	5.6	6
HIGH ST	63	3257	26	84682	9409	5.75	6
NORTH ST	93	249	30	7470	830	5.75	6
SOUTHSIDE AVE	125	3578	25	89450	9939	5.75	6
VILLARD AVE	139	3527	30	105810	11757	5.75	6
W MAIN ST	140	285	30	8550	950	5.75	6
STRATFORD LN	129	524	20	10480	1164	5.85	6
BEVERS ST	6	240	24	5760	640	5.85	6
CHESTNUT DR	18	808	20	16160	1796	5.85	6
CIRCLE DR	19	2000	20	40000	4444	5.85	6
CURRY RD	29	620	20	12400	1378	5.85	6
DEVON WAY	35	553	20	11060	1229	5.85	6
EDGEWOOD AVE	40	1056	25	26400	2933	5.85	6
FENWICK RD	47	765	20	15300	1700	5.85	6
FLOWER AVE	50	1285	20	25700	2856	5.85	6
KENT AVE	74	1524	24	36576	4064	5.85	6

ROADWAY RATING TABLE
VILLAGE OF HASTINGS-ON-HUDSON, NY

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	TOTAL	OVERALL RATING
LEFURGY AVE	75	1721	26	44746	4972	5.85	6
OVERLOOK RD	96	2245	20	44900	4989	5.85	6
ROSEDALE AVE	115	2375	30	71250	7917	5.85	6
SUMMIT ST	131	541	18	9738	1082	5.85	6
WINDSOR RD	149	807	20	16140	1793	5.85	6
WARREN ST (EAST)	143	138	20	2760	307	5.85	6
BAKER LN	4	500	16	8000	889	5.95	6
DARWIN AVE	30	595	30	17850	1983	5.95	6
GARLAND DR	54	523	15	7845	872	5.95	6
NICHOLS DR	92	545	20	10900	1211	5.95	6
OXFORD RD	97	941	30	28230	3137	5.95	6
SAUNDERS ST	118	258	28	7224	803	5.95	6
SUNSET ST	132	217	22	4774	530	5.95	6
TERRACE AVE	134	660	20	13200	1467	5.95	6
WILSON ST	148	220	25	5500	611	5.95	6
ZINSSER WAY	151	367	24	8808	979	5.95	6
MERRILL ST	85	386	28	10808	1201	6.15	6
RAVENSDALE RD	106	2776	28	77728	8636	6.15	6
SCHOOL ST	120	490	30	14700	1633	6.15	6
SPRING ST	126	265	38	10070	1119	6.15	6
TOMPKINS AVE	136	2204	30	66120	7347	6.15	6
FERNDAL DR	48	1215	20	24300	2700	6.25	6
HUDSON ST (WEST)	70	700	25	17500	1944	6.25	6
JEFFERSON AVE	72	1070	22	23540	2616	6.25	6
S CALUMET AVE	116	610	30	18300	2033	6.25	6
AMHERST DR	1	1710	30	51300	5700	6.5	7
DIVISION ST	36	300	18	5400	600	6.5	7
EDISON AVE	41	195	24	4680	520	6.5	7
FAIRMONT AVE	44	2162	22	47564	5285	6.5	7
FRASER PL	52	1298	23	29854	3317	6.5	7
HOLLY PL	65	475	24	11400	1267	6.5	7
JORDAN RD	73	1624	30	48720	5413	6.5	7
MAPLE AVE	80	1408	40	56320	6258	6.5	7
MARION AVE	84	264	26	6864	763	6.5	7
PINECREST DR	101	2048	22	45056	5006	6.5	7
S CLINTON ST	117	994	21	20874	2319	6.5	7
SOUTHGATE AVE	123	1905	22	41910	4657	6.5	7
THE FENWAY	135	290	32	9280	1031	6.5	7
BURNSIDE DR (EAST)	11	155	20	3100	344	6.6	7
CHEMKA POOL RD	17	542	22	11924	1325	6.6	7
HARVARD LN	61	820	30	24600	2733	6.6	7
HOPKE AVE	67	491	26	12766	1418	6.6	7
MARBLE TER	82	244	20	4880	542	6.6	7
PINE ST	100	230	24	5520	613	6.6	7
PINECREST PKY	102	1440	30	43200	4800	6.6	7
PRESCOTT PL	104	278	22	6116	680	6.6	7
RIDGE ST	108	542	24	13008	1445	6.6	7
RIVERVIEW PL	112	427	24	10248	1139	6.6	7
WAGNER PL	141	377	26	9802	1089	6.6	7
WARD ST	142	230	22	5060	562	6.6	7
BURNSIDE DR (WEST)	12	1202	20	24040	2671	6.9	7
CALUMET AVE	14	967	30	29010	3223	6.9	7
CROPEY LN	26	769	19	14611	1623	6.9	7
DERRY LN (WEST)	34	237	15	3555	395	6.9	7
DORCHESTER AVE	37	1095	20	21900	2433	6.9	7
EUCLID AVE	43	1925	30	57750	6417	6.9	7

ROADWAY RATING TABLE
VILLAGE OF HASTINGS-ON-HUDSON, NY

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	TOTAL	OVERALL RATING
GOODWIN ST	57	707	30	21210	2357	6.9	7
HOLLYWOOD DR	66	1217	18	21906	2434	6.9	7
PLEASANT AVE	103	359	28	10052	1117	6.9	7
RAVINE DR	107	794	18	14292	1588	6.9	7
SUMMIT DR	130	1382	18	24876	2764	6.9	7
TAFT ST	133	208	25	5200	578	6.9	7
WARREN ST (WEST)	144	727	20	14540	1616	6.9	7
WHITMAN ST	146	952	24	22848	2539	6.9	7
YALE RD	150	255	30	7650	850	6.9	7
PALISADE AVE	98	69	30	2070	230	7.15	7
PRINCE ST	105	930	20	18600	2067	7.15	7
GLENN PL	55	584	30	17520	1947	7.25	7
N END PL (EAST)	88	245	20	4900	544	7.25	7
CLINTON AVE	22	692	22	15224	1692	7.55	8
EDGARS LN	39	2214	26	57564	6396	7.55	8
GLENWOOD AVE	56	415	22	9130	1014	7.55	8
HORNER AVE	68	685	22	15070	1674	7.55	8
JAMES ST	71	2060	22	45320	5036	7.55	8
MAGNOLIA DR	78	44	30	1320	147	7.55	8
N END PL (WEST)	89	230	24	5520	613	7.65	8
LINCOLN AVE	77	2515	24	60360	6707	7.95	8
BURKELY PL	10	181	13	2353	261	8.3	8
BURNSIDE PL	13	391	20	7820	869	8.3	8
LEFURGY TER	76	167	18	3006	334	8.3	8
FARRAGUT AVE	46	2220	24	53280	5920	8.5	9
MAIN ST	79	1212	40	48480	5387	8.5	9
FLORAL DR	49	622	20	12440	1382	8.6	9
FOREST AVE	51	690	20	13800	1533	8.6	9
HAMILTON AVE	60	1662	25	41550	4617	8.6	9
HALL PL	59	147	26	3822	425	8.95	9
BUENA VISTA DR	9	827	20	16540	1838	9.25	9
OAKDALE DR	94	612	19	11628	1292	9.25	9
SCENIC DR	119	1399	20	27980	3109	9.25	9
DASSERN DR	31	2274	14	31836	3537	0	Private
DAVID LN	32	159	26	4134	459	0	Private
DUDLEY ST	38	866	24	20784	2309	0	Private
HASTINGS LNDG	62	1190	20	23800	2644	0	Private
MAPLE LANE	81	200	15	3000	333	0	Gravel
RIVERPOINTE RD	111	748	24	17952	1995	0	Private

TOTAL LENGTH (ft) 136835
TOTAL LENGTH (mi) 25.9

NOTES:

The length of roadway was taken at the center of the intersection when applicable. The areas provided are estimates and should be re-evaluated when necessary.

C – ROADWAY DISTRESS TYPES

Alligator Cracking

Typical alligator cracking is composed of frequent inter-connected cracks. The distress is load-related, so it is identified only when present in the wheelpath of a full-depth asphalt pavement.

Alligator cracking is identified as "isolated" when it occurs over less than 20% of the length of the segment, and "general" when it occurs over more than 20% of the segment.



The longitudinal crack in this photo qualifies as alligator cracking even though it lacks the interconnected cracking. The crack is in the early stages of development, but still represents a load-related distress because it occurs in the wheelpath.



Spalling

Two types of spalling can occur on concrete pavement: mid-slab when the mesh reinforcement is close to the surface and corrosion causes popouts; and at the joints, when incompressible material prevents the joint from moving and the compressive stresses in the slab fracture the concrete.

Spalling is identified as "isolated" when it occurs on less than 20% of the slabs, and "general" when it occurs on more than 20% of the slabs.



Delamination

Delamination occurs when an overlaid pavement loses the bond to the underlying layers and becomes dislodged. This distress is not identified directly in the NYSDOT survey, so when it is observed, the delaminated areas should be considered the same as cracking distress.



Widening Dropoff

Widening dropoff occurs when an old concrete pavement is widened with an asphalt overlay. The dissimilar base materials settle relative to each other, causing a dropoff at the edge of the underlying slab.

The widening dropoff dominant distress is identified as "low" severity (photo at right) when the cracking at the drop becomes well developed.



The distress is identified as "high" severity (photo at right) when the effect of the height difference can be detected when driving across the drop, or has the potential to influence the track of a vehicle.



Permanent Patching

Patches with straight, saw-cut edges are assumed to be permanent repairs to the pavement and are expected to perform as original pavement. These areas are not counted as distress until the patch itself begins to show signs of distress.



Temporary Patching

Temporary patching, such as "throw and go" patches, do not repair the structural damage in the pavement and therefore are counted as distress. These patches can be identified by their rounded, random shapes.



Crack Seal

Crack seal is an effective preventive maintenance activity that helps keep water out of the pavement structure. When a pavement is crack sealed, the sealant tends to highlight the cracks, which could make the pavement look worse and cause a decrease in the rating. Roads that are crack sealed should be given the same rating as the prior year until the continued development of the cracking extends beyond the sealed areas.



Flushing

Flushing occurs when excess liquid asphalt material rises to the surface of the pavement. This distress is not identified directly in the NYSDOT survey, but should be reported separately to the Resident Engineer and/or the Regional Materials Engineer, as it may present an urgent safety condition.



Raveling

Raveling is caused by the action of traffic on a weak surface. Raveling of a weak surface course is generally due to insufficient binder in the mix. Raveling is different than weathering, which is caused by climatic conditions that result in a drying out of the pavement surface. Raveling is the wearing away of the pavement surface, resulting in a roughened surface texture. This rough surface texture is due to the dislodging of coarse aggregate and loss of the asphalt binder.



Wheel Path Rutting

Wheel path rutting is caused by Heavy trucks, slow traffic, stopping and standing traffic and poor aggregate. This causes permanent deformations of the pavement (indentations) in the wheel paths, which can lead to cracking and further deterioration. Most common in intersections, where there is braking and stopping traffic.



Settlements and Heaves

This is described as localized pavement surface areas having elevations slightly lower than surrounding pavement or localized upward displacements of the pavement surface. Settlements are caused by failure in the lower pavement layers while heaving is caused by expansive soils, typically from water freezing within the soils during winter months.



Blowups

Blowups are caused by compression stresses resulting from heat and water, and they generally occur at a joint or crack. It is known that intrusion of foreign material, water, and chemical deicing solution into joints and cracks causes extensive damage to rigid pavements. The intrusion of incompressible soils into the joint space causes even greater problems.



Joint Sealer Failure

Liquid sealer failure is characterized by loss of bond between the sealer and the joint faces, internal tearing within the sealer itself and /or entrapment of incompressibles within the sealer matrix and/or loss of sealer from the joint.

Preformed neoprene sealer failure is characterized by loss of recovery from a compressed state and/or internal web sticking allowing the infiltration of water or incompressibles into the joint.



Transverse/ Logitudinal Joint Faulting/ Separation/ Distress

Transverse joint faulting is caused by a differential vertical displacement of abutting slabs at joints or slab cracks creating a step deformation on the pavement surface. Faulting is caused by the loss of fine material under a slab and the increase in fine material under nearby slabs. This flow of fine material is called pumping, and is caused by the presence of high levels of free moisture under a slab carrying heavy traffic loading



Slab Cracking

A crack or cracks within a pavement slab that propagate in any direction. Cracks may vary from hairline to more than one inch in width. Slab cracks are caused by shrinkage or curing stresses early on in the life of the slab. Cracks later in the slabs life can be caused by environmental and load bearing stresses. The loss of the sub base support along with excessive loading can cause slab cracking.



Scaling non-Joint Spalling

Scaling are irregularities in the pavement slab surface other than those occurring at joints and characterized by popouts and/or spalling. These distress types may be patched with asphalt. Scaling is caused by excessive water used in finishing the concretes surface or lack of proper amount of entrained air, in combination with freezing and thawing.



D – FIELD EVALUATION FORM

PAVEMENT FIELD EVALUATION FORM

VILLAGE OF HASTINGS-ON-HUDSON, NY

General

Name of Roadway: _____ Inspection Date: _____
 Roadway I.D.#: _____ Usage (H-0,M-5,L-10): _____ Inspected by: _____
 Length of Roadway: _____ Width (avg.): _____ Type (A,O,C): _____
 Start of roadway: _____ End of roadway: _____
 Last paved/rehabilitated: _____
 Known issue(s): _____

Roadway Features

Lanes: _____
 Shoulder / Side Parking: _____
 Curbs (N/A, partial, entire) _____ Curb reveal (avg): _____ Curb Type: _____
 Sidewalks (N/A, partial, entire): _____ Replace curbs (Y/N/P): _____
 Road crown (acceptable, required): _____
 Drainage type (open system, closed system): _____
 Traffic light/sensor: _____
 Notes: _____

Ride Quality

Corrugations effecting ride quality (Y,N) _____
 Settlements and heaves effecting ride quality (Y,N) _____
 Overall ride quality (very good-10, good-8, fair-6, mediocre-4, poor-2) _____

Distress Rating

Pavement: Flexible (asphalt, asphalt overlay)

Type	Section	ROADWAY REPAIR LENGTH PER SECTION (ft)				Severity	Notes
		0 - 1,000 ft	1,000 - 2,000 ft	2,000 - 3,000 ft	3,000 - 4,000 ft		
Alligator cracking							
Wheel path cracking							
Transverse cracking							
Longitudinal cracking							
Edge cracking							
Slippage cracking							
Cracking (other)							
Raveling							
Wheel path rutting							
Delamination							
Widening drop-off							
Pavement patching (temporary)							
Pavement patching (permanent)							
Crack seal							
Thin overlays							
Flushing							

Score _____

Pavement: <u>Rigid</u> (concrete)		ROADWAY REPAIR LENGTH PER SECTION (ft)				Severity	Notes
Type	Section	0 - 1,000 ft	1,000 - 2,000 ft	2,000 - 3,000 ft	3,000 - 4,000 ft		
Spalling							
Delamination							
Pavement patching (temporary)							
Pavement patching (permanent)							
Settlements and heaves							
Blowups							
Asphalt concrete overlay							
Joint sealer failure							
Trans. joint faulting/sep./distress							
Long. joint faulting/sep./distress							
Slab cracking							
Wheelpath rutting							
Scaling non-joint spalling							

Score _____

Rating

	Score	Proportion	Prorated total
Distress		65%	
Ride Quality		20%	
Usage		15%	

Total _____

Overall rating score _____

General Notes

Pavement Notes

Shoulder / Parking Notes

Drainage Notes

E – FLEXIBLE DISTRESS RATING

10

Excellent

New
Pavement

No
Distress



9

Excellent

No
Distress



F-1

Asphalt



8
Good

Infrequent

Slight



8
Good

Infrequent

Minor

Asphalt

F-2

8

Good

Infrequent

Moderate



8

Good

Infrequent
to
Occasional

Slight



F-3

Asphalt



7
Good

Infrequent
to
Occasional

Minor



7
Good

Occasional
to
Frequent

Slight

Asphalt

F-4

7
Good

Infrequent

Moderate
to
Severe



7
Good

Infrequent

Severe



F-5

Asphalt



7
Good

Infrequent
to
Occasional

Moderate



7
Good

Infrequent
to
Occasional

Moderate
to
Severe

Asphalt

F-6

7
Good

Occasional
to
Frequent

Minor



7
Good

Occasional
to
Frequent

Minor



F-7

Asphalt



6
Fair

Frequent

Minor



6
Fair

Frequent

Minor

Asphalt

F-8

6

Fair

Frequent

Minor



6

Fair

Very
Frequent

Slight



F-9

Asphalt



6

Fair

Very
Frequent

Minor



6

Fair

Occasional
to
Frequent

Moderate

Asphalt

F-10

6

Fair

Occasional
to
Frequent

Moderate
to
Severe



6

Fair

Infrequent
to
Occasional

Severe



F-11

Asphalt



6
Fair

Frequent

Moderate



6
Fair

Frequent

Moderate

Asphalt

F-12

6

Fair

Frequent

Moderate



6

Fair

Frequent

Moderate



F-13

Asphalt



5
Poor

Frequent

Moderate
to
Severe



5
Poor

Frequent

Moderate
to
Severe

Asphalt

F-14

5

Poor

Occasional
to
Frequent

Severe



5

Poor

Very
Frequent

Moderate



F-15

Asphalt



5
Poor

Very
Frequent

Moderate
to
Severe



4
Poor

Frequent

Severe

Asphalt

F-16

4
Poor

Very
Frequent

Severe



3
Very Poor

Very
Frequent

Very
Severe





2
Very Poor

Very
Frequent

Impaired
Travel



1
Very Poor

Risk of
Damage
to Vehicle

Asphalt

F-18

F – RIGID DISTRESS RATING

10
Excellent

New
Pavement

No
Distress



9
Excellent

No
Distress





8
Good

Infrequent

Slight



8
Good

Infrequent

Slight

Concrete

F-20

8

Good

Infrequent

Minor



8

Good

Infrequent

Moderate



F-21

Concrete



7
Good

Infrequent

Severe



7
Good

Infrequent
to
Occasional

Minor

Concrete

F-22

7

Good

Infrequent
to
Occasional

Minor



7

Good

Occasional
to
Frequent

Minor



F-23

Concrete



7
Good

Infrequent
to
Occasional

Moderate



7
Good

Infrequent
to
Occasional

Moderate

Concrete

F-24

7
Good

Infrequent
to
Occasional

Moderate



7
Good

Infrequent
to
Occasional

Moderate
to
Severe



F-25

Concrete



6
Fair

Occasional
to
Frequent

Moderate



6
Fair

Occasional
to
Frequent

Moderate

Concrete

F-26

6

Fair

Occasional
to
Frequent

Moderate
to
Severe



6

Fair

Occasional
to
Frequent

Moderate
to
Severe



F-27

Concrete



6
Fair

Occasional
to
Frequent

Moderate
to
Severe



6
Fair

Very
Frequent

Minor

Concrete

F-28

6
Fair

Frequent

Moderate



6
Fair

Frequent

Moderate



F-29

Concrete



5
Poor

Frequent

Moderate
to
Severe



5
Poor

Frequent

Moderate
to
Severe

Concrete

F-30

5
Poor

Frequent

Moderate
to
Severe



5
Poor

Very
Frequent

Moderate



F-31

Concrete



5
Poor

Occasional
to
Frequent

Severe



5
Poor

Occasional
to
Frequent

Severe

Concrete

F-32

4

Poor

Very
Frequent

Severe



3

Very Poor

Frequent

Very
Severe



F-33

Concrete



2
Very Poor

Very
Frequent

Impaired
Travel



1
Very Poor

Risk of
Damage
to Vehicle

Concrete

F-34

G – DISTRESS RATING TABLES

Pavement Distress Rating Warrants					
	Rating	General Description	Warrants		
			Frequency	Severity	Appearance
Flexible/Overlaid	10	No Distress Recently Constructed or Rehabilitated	No distress is present.		New pavement, dark black and neat. Typically one year old or less.
	9	No Significant Distress	All to nearly all of the pavement is free of distress; a single defect or crack per 0.10 mile is allowed.	The defect is superficial or the crack is tight.	Surface is typically oxidized to gray color. Typically one to three years old.
	8	Infrequent Distress, Slight Severity	Most of the pavement is free of cracking. Easy to count number of cracks at highway speed.	Cracks are tight and very widely spaced. No secondary cracking. No Dominant Distresses present.	Surface looks uniform and neat. May or may not be crack sealed.
	7	Infrequent to Occasional Distress with Minor Severity	Much of the pavement is free of cracking. More difficult to count number of cracks but still possible.	Cracks are mostly less than 1/8" wide. Cracks may have secondary cracking. No to very little connected cracking. May have isolated Dominant Distresses.	Looks fairly good but cracking is noticeable. Additional cracking has developed since last crack seal. Too many cracks to effectively crack seal- good candidate for single course overlay.

Pavement Distress Rating Warrants					
	Rating	General Description	Warrants		
			Frequency	Severity	Appearance
Flexible/Overlaid	6	Occasional to Frequent Distress with Moderate Severity	Much to most of the pavement is cracked. Cracks are spaced only a few feet apart or less.	Cracks vary in width from tight to greater than 1/8" wide. Most cracks have secondary cracking. Cracks extend to connect with adjacent cracks. Dominant Distresses may be common.	Condition looks "Fair." Needs work, likely more than a single course overlay.
	5	Distress is Frequent and Moderate to Severe	Nearly all the pavement or wheel paths have multiple, well developed cracks.	Cracks are wide and/or well developed with secondary cracking. Many cracks are interconnected. Pieces of pavement are dislodged or have been patched.	Condition looks "Poor." Needs major work.
	4	Distress is Frequent and Severe	Pavement is mostly cracked. Travel on the pavement is impaired.	Cracks are wide and connected. Potholes and/or patches are common. Patches on patches.	Beyond repair.

Pavement Distress Rating Warrants					
	Rating	General Description	Warrants		
			Frequency	Severity	Appearance
Rigid	10	No Distress Recently Constructed or Rehabilitated	No distress is present.		New pavement, white and neat. Typically one year old or less.
	9	No Significant Distress	All to nearly all of the pavement is free of distress; a single defect or crack per 0.10 mile is allowed.	The defect is superficial or the crack is tight.	Slight discoloration in wheel paths due to traffic. Typically one to three years old.
	8	Infrequent Distress, Slight Severity	A few slabs have minor popouts or corner breaks.	Popouts are shallow and few in number. Corner cracks, if present, are tight and not displaced. Joint distress is rare. No visible mid-slab cracking.	Slight weathered appearance on surface.
	7	Infrequent to Occasional Distress with Minor Severity	Popouts are more frequent and may be patched. Some joints show distress.	Joint spall cracks are tight and not displaced. Little or no secondary cracks. Some slabs may have a single mid-slab crack. Many slabs have mid-slab spalling and patching.	Distress is noticeable but not too severe.

Pavement Distress Rating Warrants					
	Rating	General Description	Warrants		
			Frequency	Severity	Appearance
Rigid	6	Occasional to Frequent Distress with Moderate Severity	Many slabs contain distress.	Advanced cracking at joints with some spalling and loose/displaced concrete. Mid-slab cracks are well defined. May have additional mid-slab cracks.	Distress is noticeable and needs repair.
	5	Distress is Frequent and Moderate to Severe	Most slabs contain distress. Distress covers a large portion of the slab.	Multiple cracks in the majority of slabs. Extensive cracking at joints with displaced concrete and/or patching.	Needs major work.
	4	Distress is Frequent and Severe	Most slabs are badly damaged. Extensive spalling and/or patching.	Cracks are wide. Broken concrete is common. Patches on patches.	Beyond repair.

Pavement Surface Rating Based on Frequency and Severity Descriptions

FREQUENCY	SEVERITY						
	None	Slight	Minor	Moderate to Severe	Severe	Very Severe	Impassible
No distress is present. A single random defect per 0.10 mile is allowed.	10 / 9	9	-	-	-	-	-
Most of the pavement is free of distress. One or two cracks or distresses are visible for the next 0.10 mile	-	8	8	7	7	-	-
Much of the pavement is free of cracking. Large blocks of distress free pavement are present.	-	8	7	7	6	6	-
Much (<1/2) to most (>1/2) of the pavement is cracked. Uncracked or undistressed blocks of pavement range from 20-30 ft per lane to 12 ft per lane	-	7	7	6	5	5	-
Nearly all the pavement is cracked. Uncracked or undistressed blocks of pavement are 12 ft square or less	-	7	6	5	4	3	1
Mostly cracked. Cracks or distress are continuous and spaced only a few feet apart.	-	6	6	5	4	3	1
Slight Cracks are tight, single and only a few feet long. Tight, single longitudinal joint cracks, partial or continuous, are included.							
Minor Cracks are generally < 1/8 inch wide, some with minor secondary cracks, no or very few connected cracks. May have a few small spalls (< 1 ft square).							
Moderate Cracks are generally > 1/8 inch wide; secondary cracking is common, some cracks connected may have some minor popouts or small (1-2 ft) to medium (3-4 ft) patching.							
Moderate to Severe Distresses vary from "Moderate" to "Severe."							
Severe Cracks are wide and/or have extensive interconnected secondary cracking; holes, loose material and/or patching are common. patches may have patches.							
Very Severe Cracks are very wide, holes and/or patching is extensive; patches extend across the full lane or extend several feet along the lane; patches on patches are common							
Travel is Impaired Holes in pavement are large and/or pavement has so many layers of patches that the section can be traveled only at reduced speed							
Impassible Travel by ordinary car would risk damage to the vehicle							

Notes: - Ratings in blue are the definitions from the original Pavement Rating Manual c.1981.
- "Very Slight" from the original Manual = "Slight" here.
- "Slight" from the original Manual = "Minor" here.

H – ANNUAL CHECKLIST AND COST EVALUATION

VILLAGE OF HASTINGS-ON-HUDSON

ANNUAL ROAD RE-SURFACING CHECK LIST

The items listed below should be reviewed by the Village prior to the inter-municipal paving agreement and bidding process.

DRAINAGE

YES

NO

Does drainage need to be replaced or is drainage required?

Are there any flooding issues that need to be resolved?

Are utility improvements planned?

PERMITS/APPROVALS

Are any permits or approvals required?

GENERAL INFORMATION

Do curbs need to be replaced (get length, type, cost, etc)?

Are traffic loops required?

Are pavement markings required?

Do catch basins or manhole covers need to be adjusted?

Do valve boxes need to be adjusted?

Do any other structures need to be adjusted?

BUDGET

1. Has additional cost of items listed above been determined?

ANNUAL COST EVALUATION

ROADWAY PAVING PROCEDURE VILLAGE OF HASTINGS-ON-HUDSON

Description	Estimated Quantity	Units	Unit Cost	Total
Top course		TONS		
Milling		SY		
Concrete curbs		LF		
Asphalt curbs		LF		
Stone curbs		LF		
Adjust MH/CB		EA		
Adjust valve box		EA		
Line Striping (4")		LF		
Traffic loop		EA		
			Total cost	

Other potential costs	(Y/N)
Does drainage need to be replaced or is drainage required?	
Are there any flooding issues that need to be resolved?	
Are utility improvements planned?	
Are any permits or approvals required?	

I – ESTIMATED COSTS

**ESTIMATED ROAD RESURFACING COSTS RANKING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
AMHERST DR	1	1710	30	51300	5700	633.3	\$105,450	\$105,450
AQUEDUCT LN	2	838	16	13408	1490	165.5	\$27,561	\$133,011
ASHLEY RD	3	851	18	15318	1702	189.1	\$31,487	\$164,498
BAKER LN	4	500	16	8000	889	98.8	\$16,444	\$180,942
BELLAIR DR	5	178	18	3204	356	39.6	\$6,586	\$187,528
BEVERS ST	6	240	24	5760	640	71.1	\$11,840	\$199,368
BRANDT ST	7	457	24	10968	1219	135.4	\$22,545	\$221,914
BRANFORD RD	8	1200	22	26400	2933	325.9	\$54,267	\$276,180
BUENA VISTA DR	9	827	20	16540	1838	204.2	\$33,999	\$310,179
BURKELY PL	10	181	13	2353	261	29.0	\$4,837	\$315,016
BURNSIDE DR (EAST)	11	155	20	3100	344	38.3	\$6,372	\$321,388
BURNSIDE DR (WEST)	12	1202	20	24040	2671	296.8	\$49,416	\$370,804
BURNSIDE PL	13	391	20	7820	869	96.5	\$16,074	\$386,878
CALUMET AVE	14	967	30	29010	3223	358.1	\$59,632	\$446,510
CEDARS STREET	15	942	20	18840	2093	232.6	\$38,727	\$485,237
CHAUNCEY LN	16	1212	24	29088	3232	359.1	\$59,792	\$545,029
CHEMKA POOL RD	17	542	22	11924	1325	147.2	\$24,510	\$569,539
CHESTNUT DR	18	808	20	16160	1796	199.5	\$33,218	\$602,757
CIRCLE DR	19	2000	20	40000	4444	493.8	\$82,222	\$684,979
CLARENCE AVE	20	380	22	8360	929	103.2	\$17,184	\$702,163
CLIFF ST	21	1429	18	25722	2858	317.6	\$52,873	\$755,036
CLINTON AVE	22	692	22	15224	1692	188.0	\$31,294	\$786,330
CLUNIE AVE	23	550	22	12100	1344	149.4	\$24,872	\$811,202
COCHRANE AVE	24	1653	24	39672	4408	489.8	\$81,548	\$892,750
COLUMBIA AVE	25	427	27	11529	1281	142.3	\$23,699	\$916,449
CROPSEY LN	26	769	19	14611	1623	180.4	\$30,034	\$946,483
CROSSBAR RD	27	1431	30	42930	4770	530.0	\$88,245	\$1,034,728
CROTON AVE	28	594	27	16038	1782	198.0	\$32,967	\$1,067,695
CURRY RD	29	620	20	12400	1378	153.1	\$25,489	\$1,093,184
DARWIN AVE	30	595	30	17850	1983	220.4	\$36,692	\$1,129,875
DERRY LN (EAST)	33	425	15	6375	708	78.7	\$13,104	\$1,142,979
DERRY LN (WEST)	34	237	15	3555	395	43.9	\$7,308	\$1,150,287
DEVON WAY	35	553	20	11060	1229	136.5	\$22,734	\$1,173,021
DIVISION ST	36	300	18	5400	600	66.7	\$11,100	\$1,184,121
DORCHESTER AVE	37	1095	20	21900	2433	270.4	\$45,017	\$1,229,138
EDGARS LN	39	2214	26	57564	6396	710.7	\$118,326	\$1,347,464
EDGEWOOD AVE	40	1056	25	26400	2933	325.9	\$54,267	\$1,401,731
EDISON AVE	41	195	24	4680	520	57.8	\$9,620	\$1,411,351
EDMARTH PL	42	192	20	3840	427	47.4	\$7,893	\$1,419,244
EUCLID AVE	43	1925	30	57750	6417	713.0	\$118,708	\$1,537,952
FAIRMONT AVE	44	2162	22	47564	5285	587.2	\$97,770	\$1,635,723
FARLANE DR	45	965	20	19300	2144	238.3	\$39,672	\$1,675,395
FARRAGUT AVE	46	2220	24	53280	5920	657.8	\$109,520	\$1,784,915
FENWICK RD	47	765	20	15300	1700	188.9	\$31,450	\$1,816,365
FERNDAL DR	48	1215	20	24300	2700	300.0	\$49,950	\$1,866,315
FLORAL DR	49	622	20	12440	1382	153.6	\$25,571	\$1,891,886
FLOWER AVE	50	1285	20	25700	2856	317.3	\$52,828	\$1,944,714
FOREST AVE	51	690	20	13800	1533	170.4	\$28,367	\$1,973,081
FRASER PL	52	1298	23	29854	3317	368.6	\$61,367	\$2,034,447
FULTON ST	53	539	22	11858	1318	146.4	\$24,375	\$2,058,822

**ESTIMATED ROAD RESURFACING COSTS RANKING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
GARLAND DR	54	523	15	7845	872	96.9	\$16,126	\$2,074,948
GLENN PL	55	584	30	17520	1947	216.3	\$36,013	\$2,110,961
GLENWOOD AVE	56	415	22	9130	1014	112.7	\$18,767	\$2,129,728
GOODWIN ST	57	707	30	21210	2357	261.9	\$43,598	\$2,173,327
GREEN ST	58	510	20	10200	1133	125.9	\$20,967	\$2,194,293
HALL PL	59	147	26	3822	425	47.2	\$7,856	\$2,202,150
HAMILTON AVE	60	1662	25	41550	4617	513.0	\$85,408	\$2,287,558
HARVARD LN	61	820	30	24600	2733	303.7	\$50,567	\$2,338,125
HIGH ST	63	3257	26	84682	9409	1045.5	\$174,069	\$2,512,193
HILLSIDE AVE	64	1287	30	38610	4290	476.7	\$79,365	\$2,591,558
HOLLY PL	65	475	24	11400	1267	140.7	\$23,433	\$2,614,991
HOLLYWOOD DR	66	1217	18	21906	2434	270.4	\$45,029	\$2,660,020
HOPKE AVE	67	491	26	12766	1418	157.6	\$26,241	\$2,686,262
HORNER AVE	68	685	22	15070	1674	186.0	\$30,977	\$2,717,239
HUDSON ST (EAST)	69	325	30	9750	1083	120.4	\$20,042	\$2,737,281
HUDSON ST (WEST)	70	700	25	17500	1944	216.0	\$35,972	\$2,773,253
JAMES ST	71	2060	22	45320	5036	559.5	\$93,158	\$2,866,411
JEFFERSON AVE	72	1070	22	23540	2616	290.6	\$48,388	\$2,914,798
JORDAN RD	73	1624	30	48720	5413	601.5	\$100,147	\$3,014,945
KENT AVE	74	1524	24	36576	4064	451.6	\$75,184	\$3,090,129
LEFURGY AVE	75	1721	26	44746	4972	552.4	\$91,978	\$3,182,107
LEFURGY TER	76	167	18	3006	334	37.1	\$6,179	\$3,188,286
LINCOLN AVE	77	2515	24	60360	6707	745.2	\$124,073	\$3,312,359
MAGNOLIA DR	78	44	30	1320	147	16.3	\$2,713	\$3,315,073
MAIN ST	79	1212	40	48480	5387	598.5	\$99,653	\$3,414,726
MAPLE AVE	80	1408	40	56320	6258	695.3	\$115,769	\$3,530,495
MARBLE TER	82	244	20	4880	542	60.2	\$10,031	\$3,540,526
MARIANA DR	83	781	30	23430	2603	289.3	\$48,162	\$3,588,688
MARION AVE	84	264	26	6864	763	84.7	\$14,109	\$3,602,797
MERRILL ST	85	386	28	10808	1201	133.4	\$22,216	\$3,625,013
MINTURN ST	86	832	25	20800	2311	256.8	\$42,756	\$3,667,769
MT HOPE BLVD	87	4580	34	155720	17302	1922.5	\$320,091	\$3,987,860
N END PL (EAST)	88	245	20	4900	544	60.5	\$10,072	\$3,997,932
N END PL (WEST)	89	230	24	5520	613	68.1	\$11,347	\$4,009,279
NEPERA PL	90	614	22	13508	1501	166.8	\$27,766	\$4,037,045
NEPPERHAN AVE	91	580	23	13340	1482	164.7	\$27,421	\$4,064,466
NICHOLS DR	92	545	20	10900	1211	134.6	\$22,406	\$4,086,872
NORTH ST	93	249	30	7470	830	92.2	\$15,355	\$4,102,227
OAKDALE DR	94	612	19	11628	1292	143.6	\$23,902	\$4,126,129
OLINDA AVE	95	510	30	15300	1700	188.9	\$31,450	\$4,157,579
OVERLOOK RD	96	2245	20	44900	4989	554.3	\$92,294	\$4,249,873
OXFORD RD	97	941	30	28230	3137	348.5	\$58,028	\$4,307,902
PALISADE AVE	98	69	30	2070	230	25.6	\$4,255	\$4,312,157
PEARL ST	99	234	24	5616	624	69.3	\$11,544	\$4,323,701
PINE ST	100	230	24	5520	613	68.1	\$11,347	\$4,335,047
PINECREST DR	101	2048	22	45056	5006	556.2	\$92,615	\$4,427,663
PINECREST PKY	102	1440	30	43200	4800	533.3	\$88,800	\$4,516,463
PLEASANT AVE	103	359	28	10052	1117	124.1	\$20,662	\$4,537,125
PRESCOTT PL	104	278	22	6116	680	75.5	\$12,572	\$4,549,697
PRINCE ST	105	930	20	18600	2067	229.6	\$38,233	\$4,587,930

**ESTIMATED ROAD RESURFACING COSTS RANKING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH (FT)	AVERAGE WIDTH (FT)	AREA (SF)	AREA (SY)	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
RAVENSDALE RD	106	2776	28	77728	8636	959.6	\$159,774	\$4,747,704
RAVINE DR	107	794	18	14292	1588	176.4	\$29,378	\$4,777,082
RIDGE ST	108	542	24	13008	1445	160.6	\$26,739	\$4,803,821
RIDGEDELL AVE	109	193	20	3860	429	47.7	\$7,934	\$4,811,755
RIVER ST	110	1506	45	67770	7530	836.7	\$139,305	\$4,951,060
RIVERVIEW PL	112	427	24	10248	1139	126.5	\$21,065	\$4,972,126
RONNY CIR	113	677	20	13540	1504	167.2	\$27,832	\$4,999,958
ROSE ST	114	1181	24	28344	3149	349.9	\$58,263	\$5,058,221
ROSEDALE AVE	115	2375	30	71250	7917	879.6	\$146,458	\$5,204,679
S CALUMET AVE	116	610	30	18300	2033	225.9	\$37,617	\$5,242,296
S CLINTON ST	117	994	21	20874	2319	257.7	\$42,908	\$5,285,203
SAUNDERS ST	118	258	28	7224	803	89.2	\$14,849	\$5,300,053
SCENIC DR	119	1399	20	27980	3109	345.4	\$57,514	\$5,357,567
SCHOOL ST	120	490	30	14700	1633	181.5	\$30,217	\$5,387,784
SHELDON PL	121	803	20	16060	1784	198.3	\$33,012	\$5,420,796
SOUTH DR	122	576	20	11520	1280	142.2	\$23,680	\$5,444,476
SOUTHGATE AVE	123	1905	22	41910	4657	517.4	\$86,148	\$5,530,624
SOUTHLAWN AVE	124	108	32	3456	384	42.7	\$7,104	\$5,537,728
SOUTHSIDE AVE	125	3578	25	89450	9939	1104.3	\$183,869	\$5,721,598
SPRING ST	126	265	38	10070	1119	124.3	\$20,699	\$5,742,297
STANLEY AVE (NORTH)	127	621	30	18630	2070	230.0	\$38,295	\$5,780,592
STANLEY AVE (SOUTH)	128	1591	20	31820	3536	392.8	\$65,408	\$5,846,000
STRATFORD LN	129	524	20	10480	1164	129.4	\$21,542	\$5,867,542
SUMMIT DR	130	1382	18	24876	2764	307.1	\$51,134	\$5,918,676
SUMMIT ST	131	541	18	9738	1082	120.2	\$20,017	\$5,938,693
SUNSET ST	132	217	22	4774	530	58.9	\$9,813	\$5,948,506
TAFT ST	133	208	25	5200	578	64.2	\$10,689	\$5,959,195
TERRACE AVE	134	660	20	13200	1467	163.0	\$27,133	\$5,986,329
THE FENWAY	135	290	32	9280	1031	114.6	\$19,076	\$6,005,404
TOMPKINS AVE	136	2204	30	66120	7347	816.3	\$135,913	\$6,141,318
TRAVIS PL	137	305	25	7625	847	94.1	\$15,674	\$6,156,991
VALLEY PL	138	429	26	11154	1239	137.7	\$22,928	\$6,179,919
VILLARD AVE	139	3527	30	105810	11757	1306.3	\$217,498	\$6,397,417
W MAIN ST	140	285	30	8550	950	105.6	\$17,575	\$6,414,992
WAGNER PL	141	377	26	9802	1089	121.0	\$20,149	\$6,435,141
WARD ST	142	230	22	5060	562	62.5	\$10,401	\$6,445,542
WARREN ST (EAST)	143	138	20	2760	307	34.1	\$5,673	\$6,451,215
WARREN ST (WEST)	144	727	20	14540	1616	179.5	\$29,888	\$6,481,103
WASHINGTON AVE	145	1780	30	53400	5933	659.3	\$109,767	\$6,590,870
WHITMAN ST	146	952	24	22848	2539	282.1	\$46,965	\$6,637,835
WILLIAM ST	147	414	25	10350	1150	127.8	\$21,275	\$6,659,110
WILSON ST	148	220	25	5500	611	67.9	\$11,306	\$6,670,416
WINDSOR RD	149	807	20	16140	1793	199.3	\$33,177	\$6,703,592
YALE RD	150	255	30	7650	850	94.4	\$15,725	\$6,719,317
ZINSSER WAY	151	367	24	8808	979	108.7	\$18,105	\$6,737,423

J – SEQUENCING PLAN

**ROAD RESURFACING SEQUENCING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH* (FT)	AVERAGE WIDTH* (FT)	AREA* (SF)	AREA* (SY)	OVERALL RATING	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE* (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
2016									
DERRY LN (EAST)	33	425	15	6375	708	3	78.7	\$13,104	\$13,104
ASHLEY RD	3	851	18	15318	1702	4	189.1	\$31,487	\$44,591
ROSE ST	114	1181	24	28344	3149	4	349.9	\$58,263	\$102,854
GREEN ST	58	510	20	10200	1133	5	125.9	\$20,967	\$123,821
BRANFORD RD	8	1200	22	26400	2933	5	325.9	\$54,267	\$178,087
HUDSON ST (EAST)	69	325	30	9750	1083	5	120.4	\$20,042	\$198,129
2017									
WILLIAM ST	147	414	25	10350	1150	4	127.8	\$21,275	\$21,275
AQUEDUCT LN	2	838	16	13408	1490	5	165.5	\$27,561	\$48,836
WASHINGTON AVE*	145	1500	30	45000	5000	5	555.6	\$92,500	\$141,336
RIDGEDELL AVE	109	193	20	3860	429	5	47.7	\$7,934	\$149,270
RIVER ST**	110	600	45	27000	3000	5	333.3	\$55,500	\$204,770
2018									
RIVER ST**	110	906	45	40770	4530	5	503.3	\$83,805	\$83,805
CHAUNCEY LN*	16	400	24	9600	1067	5	118.5	\$19,733	\$103,538
HILLSIDE AVE	64	1287	30	38610	4290	5	476.7	\$79,365	\$182,903
CROTON AVE	28	594	27	16038	1782	5	198.0	\$32,967	\$215,870
2019									
BRANDT ST	7	457	24	10968	1219	5	135.4	\$22,545	\$22,545
FULTON ST	53	539	22	11858	1318	5	146.4	\$24,375	\$46,920
CROSSBAR RD	27	1431	30	42930	4770	5	530.0	\$88,245	\$135,165
CEDARS STREET	15	942	20	18840	2093	5	232.6	\$38,727	\$173,892
RONNY CIR	113	677	20	13540	1504	5	167.2	\$27,832	\$201,724
2020									
COCHRANE AVE	24	1653	24	39672	4408	5	489.8	\$81,548	\$81,548
CLARENCE AVE	20	380	22	8360	929	5	103.2	\$17,184	\$98,732
STANLEY AVE (NORTH)	127	621	30	18630	2070	5	230.0	\$38,295	\$137,027
STANLEY AVE (SOUTH)	128	1591	20	31820	3536	5	392.8	\$65,408	\$202,435

**ROAD RESURFACING SEQUENCING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH* (FT)	AVERAGE WIDTH* (FT)	AREA* (SF)	AREA* (SY)	OVERALL RATING	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE* (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
<u>2021</u>									
VALLEY PL	138	429	26	11154	1239	5	137.7	\$22,928	\$22,928
MT HOPE BLVD**	87	1200	34	40800	4533	5	503.7	\$83,867	\$106,794
FARLANE DR	45	965	20	19300	2144	5	238.3	\$39,672	\$146,467
SOUTH DR	122	576	20	11520	1280	5	142.2	\$23,680	\$170,147
OLINDA AVE	95	510	30	15300	1700	5	188.9	\$31,450	\$201,597
<u>2022</u>									
CLIFF ST	21	1429	18	25722	2858	5	317.6	\$52,873	\$52,873
MT HOPE BLVD**	87	2200	34	74800	8311	5	923.5	\$153,756	\$206,629
<u>2023</u>									
BELLAIR DR	5	178	18	3204	356	5	39.6	\$6,586	\$6,586
SOUTHLAWN AVE	124	108	32	3456	384	5	42.7	\$7,104	\$13,690
SHELDON PL	121	803	20	16060	1784	5	198.3	\$33,012	\$46,702
MINTURN ST	86	832	25	20800	2311	5	256.8	\$42,756	\$89,458
FLOWER AVE	50	1285	20	25700	2856	6	317.3	\$52,828	\$142,286
ZINSSER WAY	151	367	24	8808	979	6	108.7	\$18,105	\$160,391
DARWIN AVE	30	595	30	17850	1983	6	220.4	\$36,692	\$197,083
<u>2024</u>									
MARIANA DR	83	781	30	23430	2603	5	289.3	\$48,162	\$48,162
TOMPKINS AVE	136	2204	30	66120	7347	6	816.3	\$135,913	\$184,075
CURRY RD	29	620	20	12400	1378	6	153.1	\$25,489	\$209,564
<u>2025</u>									
MT HOPE BLVD**	87	550	34	18700	2078	5	230.9	\$38,439	\$38,439
GARLAND DR	54	523	15	7845	872	6	96.9	\$16,126	\$54,565
LEFURGY AVE	75	1721	26	44746	4972	6	552.4	\$91,978	\$146,543
JEFFERSON AVE	72	1070	22	23540	2616	6	290.6	\$48,388	\$194,930

**ROAD RESURFACING SEQUENCING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH* (FT)	AVERAGE WIDTH* (FT)	AREA* (SF)	AREA* (SY)	OVERALL RATING	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE* (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
Re-evaluate									
STRATFORD LN	129	524	20	10480	1164	6	129.4	\$21,542	\$21,542
EDMARTH PL	42	192	20	3840	427	6	47.4	\$7,893	\$29,436
PEARL ST	99	234	24	5616	624	6	69.3	\$11,544	\$40,980
TRAVIS PL	137	305	25	7625	847	6	94.1	\$15,674	\$56,653
CLUNIE AVE	23	550	22	12100	1344	6	149.4	\$24,872	\$81,525
COLUMBIA AVE	25	427	27	11529	1281	6	142.3	\$23,699	\$105,224
NEPERA PL	90	614	22	13508	1501	6	166.8	\$27,766	\$132,990
NEPPERHAN AVE	91	580	23	13340	1482	6	164.7	\$27,421	\$160,411
HIGH ST	63	3257	26	84682	9409	6	1045.5	\$174,069	\$334,480
NORTH ST	93	249	30	7470	830	6	92.2	\$15,355	\$349,835
SOUTHSIDE AVE	125	3578	25	89450	9939	6	1104.3	\$183,869	\$533,704
VILLARD AVE	139	3527	30	105810	11757	6	1306.3	\$217,498	\$751,203
W MAIN ST	140	285	30	8550	950	6	105.6	\$17,575	\$768,778
BEVERS ST	6	240	24	5760	640	6	71.1	\$11,840	\$780,618
CHESTNUT DR	18	808	20	16160	1796	6	199.5	\$33,218	\$813,836
CIRCLE DR	19	2000	20	40000	4444	6	493.8	\$82,222	\$896,058
DEVON WAY	35	553	20	11060	1229	6	136.5	\$22,734	\$918,792
EDGEWOOD AVE	40	1056	25	26400	2933	6	325.9	\$54,267	\$973,059
FENWICK RD	47	765	20	15300	1700	6	188.9	\$31,450	\$1,004,509
KENT AVE	74	1524	24	36576	4064	6	451.6	\$75,184	\$1,079,693
SUMMIT ST	131	541	18	9738	1082	6	120.2	\$20,017	\$1,099,710
OVERLOOK RD	96	2245	20	44900	4989	6	554.3	\$92,294	\$1,192,004
WINDSOR RD	149	807	20	16140	1793	6	199.3	\$33,177	\$1,225,181
ROSEDALE AVE	115	2375	30	71250	7917	6	879.6	\$146,458	\$1,371,639
WARREN ST (EAST)	143	138	20	2760	307	6	34.1	\$5,673	\$1,377,313
BAKER LN	4	100	16	1600	178	6	19.8	\$3,289	\$1,380,602
NICHOLS DR	92	545	20	10900	1211	6	134.6	\$22,406	\$1,403,007
OXFORD RD	97	941	30	28230	3137	6	348.5	\$58,028	\$1,461,035
SAUNDERS ST	118	258	28	7224	803	6	89.2	\$14,849	\$1,475,885

**ROAD RESURFACING SEQUENCING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH* (FT)	AVERAGE WIDTH* (FT)	AREA* (SF)	AREA* (SY)	OVERALL RATING	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE* (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
SUNSET ST	132	217	22	4774	530	6	58.9	\$9,813	\$1,485,698
TERRACE AVE	134	660	20	13200	1467	6	163.0	\$27,133	\$1,512,831
WILSON ST	148	220	25	5500	611	6	67.9	\$11,306	\$1,524,137
MERRILL ST	85	386	28	10808	1201	6	133.4	\$22,216	\$1,546,353
RAVENSDALE RD	106	2776	28	77728	8636	6	959.6	\$159,774	\$1,706,128
SCHOOL ST	120	490	30	14700	1633	6	181.5	\$30,217	\$1,736,344
SPRING ST	126	265	38	10070	1119	6	124.3	\$20,699	\$1,757,044
FERNDAL DR	48	1215	20	24300	2700	6	300.0	\$49,950	\$1,806,994
HUDSON ST (WEST)	70	700	25	17500	1944	6	216.0	\$35,972	\$1,842,966
S CALUMET AVE	116	610	30	18300	2033	6	225.9	\$37,617	\$1,880,583
AMHERST DR	1	1710	30	51300	5700	7	633.3	\$105,450	\$1,986,033
DIVISION ST	36	300	18	5400	600	7	66.7	\$11,100	\$1,997,133
EDISON AVE	41	195	24	4680	520	7	57.8	\$9,620	\$2,006,753
FAIRMONT AVE	44	2162	22	47564	5285	7	587.2	\$97,770	\$2,104,523
FRASER PL	52	1298	23	29854	3317	7	368.6	\$61,367	\$2,165,890
HOLLY PL	65	475	24	11400	1267	7	140.7	\$23,433	\$2,189,323
JORDAN RD	73	1624	30	48720	5413	7	601.5	\$100,147	\$2,289,470
MAPLE AVE	80	1408	40	56320	6258	7	695.3	\$115,769	\$2,405,238
MARION AVE	84	264	26	6864	763	7	84.7	\$14,109	\$2,419,348
PINECREST DR	101	2048	22	45056	5006	7	556.2	\$92,615	\$2,511,963
S CLINTON ST	117	994	21	20874	2319	7	257.7	\$42,908	\$2,554,871
SOUTHGATE AVE	123	1905	22	41910	4657	7	517.4	\$86,148	\$2,641,019
THE FENWAY	135	290	32	9280	1031	7	114.6	\$19,076	\$2,660,094
BURNSIDE DR (EAST)	11	155	20	3100	344	7	38.3	\$6,372	\$2,666,467
CHEMKA POOL RD	17	542	22	11924	1325	7	147.2	\$24,510	\$2,690,977
HARVARD LN	61	820	30	24600	2733	7	303.7	\$50,567	\$2,741,544
HOPKE AVE	67	491	26	12766	1418	7	157.6	\$26,241	\$2,767,785
MARBLE TER	82	244	20	4880	542	7	60.2	\$10,031	\$2,777,816
PINE ST	100	230	24	5520	613	7	68.1	\$11,347	\$2,789,163
PINECREST PKY	102	1440	30	43200	4800	7	533.3	\$88,800	\$2,877,963

**ROAD RESURFACING SEQUENCING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

STREET NAME	#	LENGTH* (FT)	AVERAGE WIDTH* (FT)	AREA* (SF)	AREA* (SY)	OVERALL RATING	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE* (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
PRESCOTT PL	104	278	22	6116	680	7	75.5	\$12,572	\$2,890,535
RIDGE ST	108	542	24	13008	1445	7	160.6	\$26,739	\$2,917,273
RIVERVIEW PL	112	427	24	10248	1139	7	126.5	\$21,065	\$2,938,339
WAGNER PL	141	377	26	9802	1089	7	121.0	\$20,149	\$2,958,487
WARD ST	142	230	22	5060	562	7	62.5	\$10,401	\$2,968,888
BURNSIDE DR (WEST)	12	1202	20	24040	2671	7	296.8	\$49,416	\$3,018,304
CALUMET AVE	14	967	30	29010	3223	7	358.1	\$59,632	\$3,077,935
CROPSEY LN	26	769	19	14611	1623	7	180.4	\$30,034	\$3,107,969
DERRY LN (WEST)	34	237	15	3555	395	7	43.9	\$7,308	\$3,115,277
DORCHESTER AVE	37	1095	20	21900	2433	7	270.4	\$45,017	\$3,160,293
EUCLID AVE	43	1925	30	57750	6417	7	713.0	\$118,708	\$3,279,002
GOODWIN ST	57	707	30	21210	2357	7	261.9	\$43,598	\$3,322,600
HOLLYWOOD DR	66	1217	18	21906	2434	7	270.4	\$45,029	\$3,367,629
PLEASANT AVE	103	359	28	10052	1117	7	124.1	\$20,662	\$3,388,291
RAVINE DR	107	794	18	14292	1588	7	176.4	\$29,378	\$3,417,669
SUMMIT DR	130	1382	18	24876	2764	7	307.1	\$51,134	\$3,468,803
TAFT ST	133	208	25	5200	578	7	64.2	\$10,689	\$3,479,492
WARREN ST (WEST)	144	727	20	14540	1616	7	179.5	\$29,888	\$3,509,380
WHITMAN ST	146	952	24	22848	2539	7	282.1	\$46,965	\$3,556,345
YALE RD	150	255	30	7650	850	7	94.4	\$15,725	\$3,572,070
PALISADE AVE	98	69	30	2070	230	7	25.6	\$4,255	\$3,576,325
PRINCE ST	105	930	20	18600	2067	7	229.6	\$38,233	\$3,614,559
GLENN PL	55	584	30	17520	1947	7	216.3	\$36,013	\$3,650,572
N END PL (EAST)	88	245	20	4900	544	7	60.5	\$10,072	\$3,660,644
CLINTON AVE	22	692	22	15224	1692	8	188.0	\$31,294	\$3,691,938
EDGARS LN	39	2214	26	57564	6396	8	710.7	\$118,326	\$3,810,264
GLENWOOD AVE	56	415	22	9130	1014	8	112.7	\$18,767	\$3,829,031
HORNER AVE	68	685	22	15070	1674	8	186.0	\$30,977	\$3,860,009
JAMES ST	71	2060	22	45320	5036	8	559.5	\$93,158	\$3,953,166
MAGNOLIA DR	78	44	30	1320	147	8	16.3	\$2,713	\$3,955,880

**ROAD RESURFACING SEQUENCING
VILLAGE OF HASTINGS-ON-HUDSON, NY**

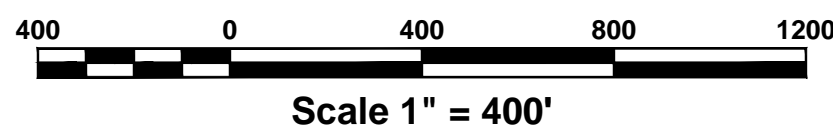
STREET NAME	#	LENGTH* (FT)	AVERAGE WIDTH* (FT)	AREA* (SF)	AREA* (SY)	OVERALL RATING	TONNAGE (per 2" mill and pave)	COST MILL AND PAVE* (\$117/ton, \$5.50/SY)	CUMMULATIVE COSTS
N END PL (WEST)	89	230	24	5520	613	8	68.1	\$11,347	\$3,967,226
LINCOLN AVE	77	2515	24	60360	6707	8	745.2	\$124,073	\$4,091,300
BURKELY PL	10	181	13	2353	261	8	29.0	\$4,837	\$4,096,136
BURNSIDE PL	13	391	20	7820	869	8	96.5	\$16,074	\$4,112,211
LEFURGY TER	76	167	18	3006	334	8	37.1	\$6,179	\$4,118,390
MAIN ST	79	1212	40	48480	5387	9	598.5	\$99,653	\$4,218,043
FARRAGUT AVE	46	2220	24	53280	5920	9	657.8	\$109,520	\$4,327,563
FLORAL DR	49	622	20	12440	1382	9	153.6	\$25,571	\$4,353,134
FOREST AVE	51	690	20	13800	1533	9	170.4	\$28,367	\$4,381,501
HAMILTON AVE	60	1662	25	41550	4617	9	513.0	\$85,408	\$4,466,909
HALL PL	59	147	26	3822	425	9	47.2	\$7,856	\$4,474,766
BUENA VISTA DR	9	827	20	16540	1838	9	204.2	\$33,999	\$4,508,765
OAKDALE DR	94	612	19	11628	1292	9	143.6	\$23,902	\$4,532,667
SCENIC DR	119	1399	20	27980	3109	9	345.4	\$57,514	\$4,590,181

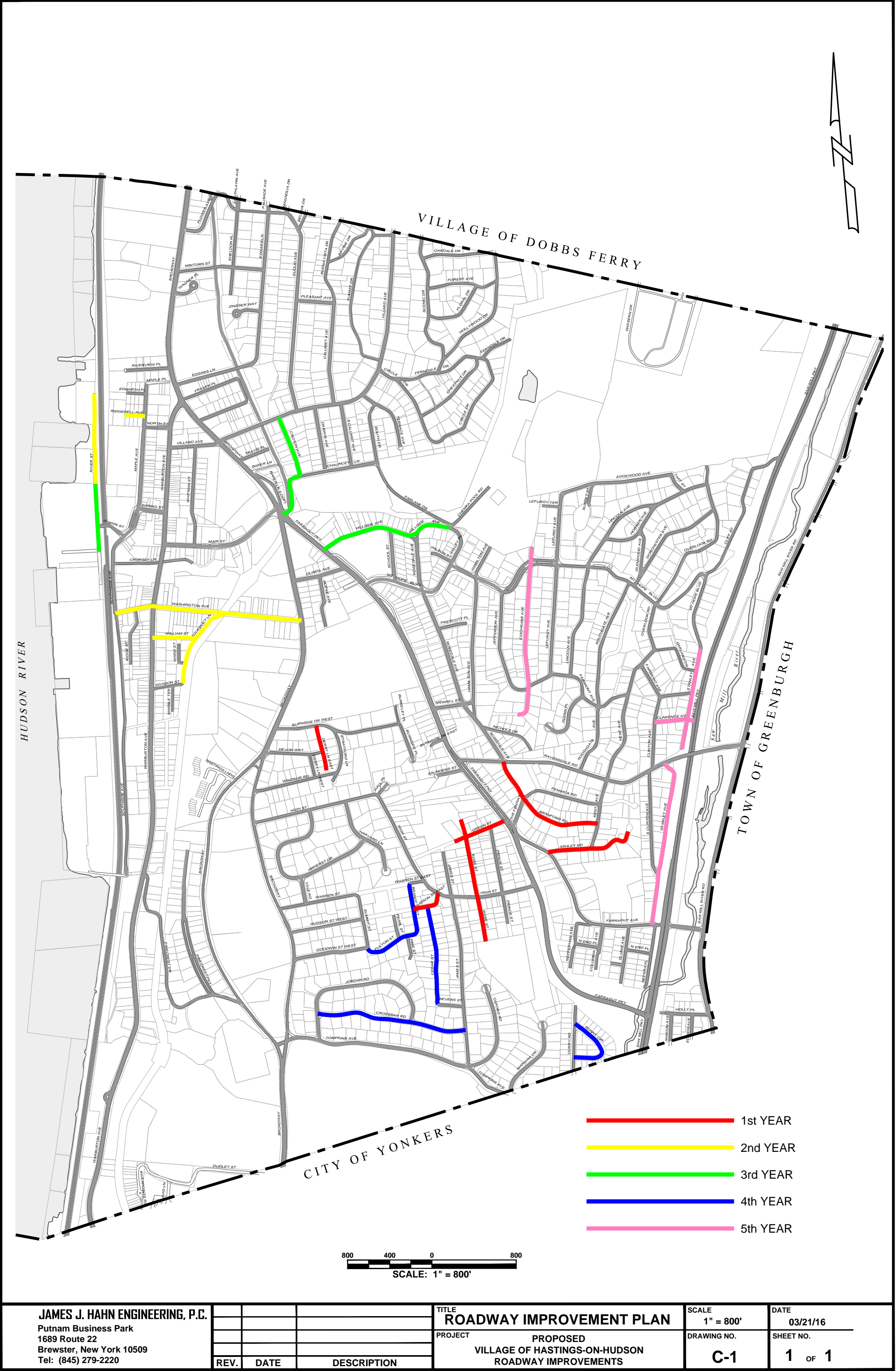
*Actual quantities must be verified prior to bid. Costs shown are present worth values, not projected. Miscellaneous items not included.

**Values DO NOT reflect the entire roadway, they ONLY reflect a portion of the roadway that is to be resurfaced.

***Due to the extensive length of the roadway, resurfacing work has been segmented and included in various years.

NOTES:
The length of roadway was taken at the center of the intersection when applicable. The areas provided are estimates and should be re-evaluated when necessary.





JAMES J. HAHN ENGINEERING, P.C.
Putnam Business Park
1689 Route 22
Brewster, New York 10509
Tel: (845) 279-2220

REV.	DATE	DESCRIPTION

TITLE	ROADWAY IMPROVEMENT PLAN
PROJECT	PROPOSED VILLAGE OF HASTINGS-ON-HUDSON ROADWAY IMPROVEMENTS

SCALE	1" = 800'
DRAWING NO.	C-1

DATE	03/21/16
SHEET NO.	1 OF 1