



Appendix B - Color Coded Chart

**NASSCO'S PIPELINE ASSESSMENT CERTIFICATION PROGRAM® (PACP®)**

**Section 4 — Structural Defect Coding**

<b>C CRACK 4-3</b> CL Longitudinal CC Circumferential CM Multiple CS Spiral CH Hinge (2, 3, 4)	<b>F FRACTURE 4-9</b> FL Longitudinal FC Circumferential FM Multiple FS Spiral FH Hinge (2, 3, 4)	<b>B BROKEN 4-17</b> BSV Soil Visible BVV Void Visible	<b>H HOLE 4-21</b> HSV Soil Visible HVV Void Visible	<b>D DEFORMED 4-25 (Rigid)</b> DR Deformed Rigid No modifiers used.	<b>D DEFORMED 4-25 (Flexible)</b> DFBR Bulging Round DFBI Bulging Inv.Curv. DFC Creasing DFE Elliptical	<b>D DEFORMED 4-25 (Brick)</b> DTBR Bulging Round DTBI Bulging Inv.Curv.
<b>X COLLAPSE 4-37</b> X Collapse No descriptors and no modifiers used.	<b>J JOINT 4-43</b> JOS Offset Small JOM Offset Medium JOL Offset Large	<b>J JOINT 4-43</b> JOSD Offset Small Defect JOMD Offset Medium Defect JOLD Offset Large Defect	<b>J JOINT 4-43</b> JSS Separation Small JSM Separation Med. JSL Separation Large	<b>J JOINT 4-43</b> JAS Angular Small JAM Angular Medium JAL Angular Large	<b>S SURFACE 4-51 DAMAGE</b> SRI Roughness Increased SAV Aggregate Visible SAP Aggregate Projecting SAM Aggregate Missing	<b>S SURFACE 4-51 DAMAGE</b> SRV Reinforcement Visible SRP Reinforcmt.Projecting SRC Reinforcmt.Corroded SMW Missing Wall
<b>S SURFACE 4-51 DAMAGE</b> SSS Surface Spalling SSC Surface Spalling Coating SCP Chemical Attack SZ Other	<b>LF LINING 4-67 FEATURES</b> LFAC Abdn'd Connection LFAS Annular Space LFB Blistered Lining LFCS Service Cut Shifted	<b>LF LINING 4-67 FEATURES</b> LFD Detached LFDC Discoloration LFDE Defective End LFDL Delamination	<b>LF LINING 4-67 FEATURES</b> LFOC Overcut Service LFRS Resin Slug LFUC Undercut Service LFW Wrinkled LFZ Other	<b>WF WELD 4-85 FAILURE</b> WFC Circumferential WFL Longitudinal WFM Multiple WFS Spiral WFZ Other	<b>RP POINT REPAIR 4-89</b> RPL Liner RPLD Liner Defective RPP Patch RPPD Patch Defective	<b>RP POINT REPAIR 4-89</b> RPR Replacement RPRD Replmt. Defective RPZ Other RPZD Other Defective
<b>BRICKWORK 4-97</b> DB Displaced MB Missing DI Dropped Invert	<b>BRICKWORK 4-97</b> MMS Mortar Missing Small MMM Mortar Missing Med. MML Mortar Missing Large					



## Appendix B - Color Coded Chart

# NASSCO'S PIPELINE ASSESSMENT CERTIFICATION PROGRAM® (PACP)®

## Section 5 — Operation and Maintenance

<b>D DEPOSITS 5-3</b> (Attached) DAE Encrustation DAGS Grease DAR Ragging DAZ Other	<b>D DEPOSITS 5-4</b> (Settled) DSF Fine DSGV Gravel DSC Hard/Compact DSZ Other	<b>D DEPOSITS 5-4</b> (Ingress) DNF Fine (silt/sand) DNGV Gravel DNZ Other	<b>R ROOTS 5-11</b> (Fine) RFB Barrel RFL Lateral RFC Connection RFJ Joint	<b>R ROOTS 5-11</b> (Medium) RMB Barrel RML Lateral RMC Connection RMJ Joint	<b>R ROOTS 5-11</b> (Ball) RBB Barrel RBL Lateral RBC Connection RBJ Joint	<b>R ROOTS 5-11</b> (Tap) RTB Barrel RTL Lateral RTC Connection RTJ Joint	
<b>I INFILTRATION 5-19</b> IS Stain ISB Barrel ISC Connection ISJ Joint ISL Lateral	<b>I INFILTRATION 5-19</b> IW Weeper IWB Barrel IWC Connection IWJ Joint IWL Lateral	<b>I INFILTRATION 5-19</b> ID Dripper IDB Barrel IDC Connection IDJ Joint IDL Lateral	<b>I INFILTRATION 5-19</b> IR Runner IRB Barrel IRC Connection IRJ Joint IRL Lateral	<b>I INFILTRATION 5-19</b> IG Gusher IGB Barrel IGC Connection IGJ Joint IGL Lateral	<b>OB OBSTACLES 5-31</b> <b>OBSTRUCTIONS</b> OBB Brick or Masonry OBC Object Through Connection OBI Object Intruding Through Wall	<b>OB OBSTACLES 5-31</b> <b>OBSTRUCTIONS</b> OBJ Object in Joint OBM Pipe Material in Invert OBN Construction Debris OBP External Pipe Cable	
<b>OB OBSTACLES 5-31</b> <b>OBSTRUCTIONS</b> OBR Rocks OBS Built In Structure OBZ Other	<b>V VERMIN 5-45</b> VR Rat VC Cockroach VZ Other	<b>G GROUT TEST 5-49</b> <b>&amp; SEAL</b> GTP Grout Test Passed GTPJ Joint GTPL Lateral GTF Grout Test Failed GTFJ Joint GTFL Lateral	<b>G GROUT TEST 5-49</b> <b>&amp; SEAL</b> GTU Grout Test Unable GTUJ Joint GTUL Lateral GRT Grout Test Location				

## Section 6 — Construction Features

<b>T TAP 6-3</b> TB Break-In/Hammer TBI Intruding TBD Defective TBC Capped TBA Activity TBB Abandoned	<b>T TAP 6-3</b> TF Factory Made TFI Intruding TFD Defective TFC Capped TFA Activity TFB Abandoned	<b>T TAP 6-3</b> TR Rehabilitated TRI Intruding TRD Defective TRC Capped TRA Activity TRB Abandoned	<b>T TAP 6-3</b> TS Saddle TSI Intruding TSD Defective TSC Capped TSA Activity TSB Abandoned	<b>IS INTRUDING SEALING MATERIAL 6-15</b> ISSR Sealing Ring ISSRB Broken ISSRH Hanging ISSRL Loose ISGT Grout ISZ Other
<b>L LINE 6-21</b> (of sewer) LD Down LL Left LLD Left Down LLU Left Up	<b>L LINE 6-21</b> (of sewer) LR Right LRD Right Down LRU Right Up LU Up	<b>A ACCESS POINT 6-25</b> ACB Catch Basin ACO Cleanout ACOM Mainline ACOP Property ACOH House	<b>A ACCESS POINT 6-25</b> ADP Discharge Point AEP End of Pipe AJB Junction Box AM Meter AMH Manhole	<b>A ACCESS POINT 6-25</b> AOC Other Structure ATC Tee Connection AWA Wastewater Access AWW Wetwell AZ Other

## Section 7 — Miscellaneous Features

<b>M MISCELLANEOUS FEATURES 7-1</b> MCU Camera Underwater MGO General Observation MGP General Photograph MJL Joint Length	<b>M MISCELLANEOUS FEATURES 7-1</b> MLC Lining Change MMC Material Change MSC Shape/Size Change MSA Survey Abandoned MWL Water Level	<b>M MISCELLANEOUS FEATURES 7-1</b> MWLS Water Level Sag MWM Water Mark MY Dye Test MYV Dye Visible MYN Not Visible
---	---	--



### Appendix B - Color Coded Chart

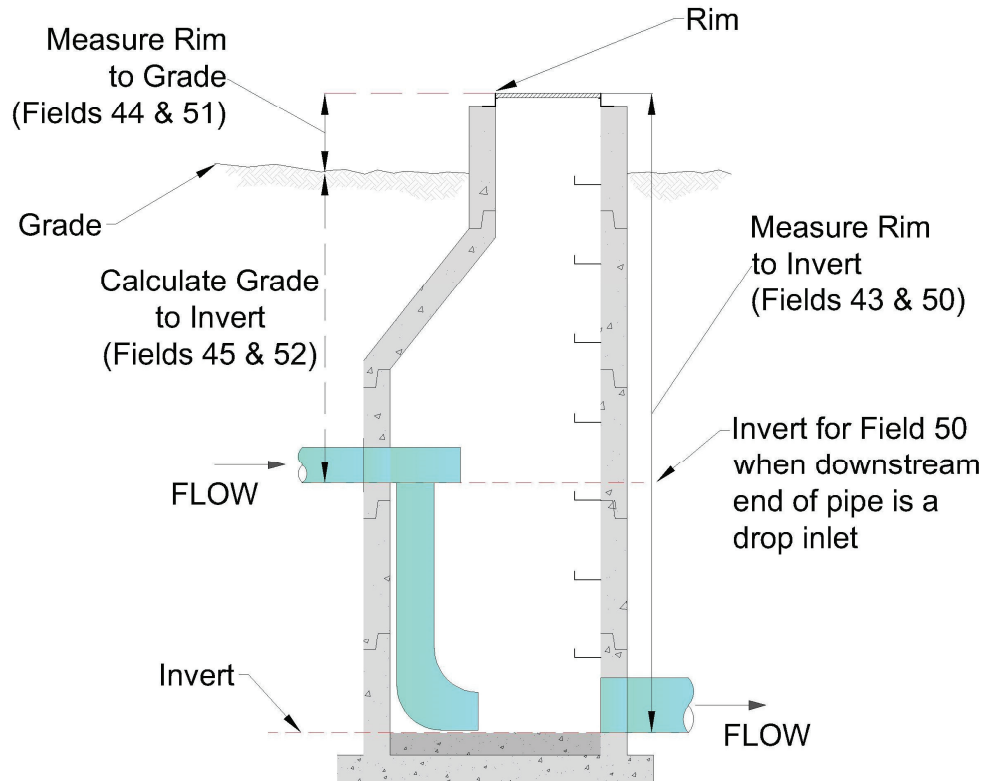
## NASSCO'S PIPELINE ASSESSMENT CERTIFICATION PROGRAM® (PACP)®

### Section 2 — Header Form Fields

<b>14 Weather 2-5</b> 1 = Dry 2 = Heavy Rain 3 = Light Rain 4 = Snow 5 = Dry Weather/Wet Ground	<b>15 Pre-Cleaning 2-5</b> H = Heavy Cleaning L = Light Cleaning (Jetting) N = No Pre-Cleaning X = Not Known Z = Other	<b>17 Flow Control 2-6</b> B = Bypassed D = Dewatered Using Jetter L = Lift Station N = Not Controlled P = Plugged	<b>18 Purpose 2-7</b> A = Maintenance B = Infiltration/Inflow Invest. C = Post-Rehabilitation D = Pre-Rehabilitation E = Pre-Acceptance F = Routine Assessment	<b>18 Purpose 2-7</b> G = Capital Improvement Program Assessment H = Resurvey I = SSES R = Pre-Existing Video X = Not Known	<b>19 Direction 2-7</b> D = Downstream U = Upstream
<b>20 Inspection Technology 2-8</b> CC = CCTV LA = Laser SO = Sonar SS = Sidewall Scanning ZM = Zoom ZZ = Other	<b>21 Inspection Status 2-8</b> BM = Buried & Marked CI = Complete Inspection NA = No Access NE = Does Not Exist	<b>21 Inspection Status 2-8</b> NF = Not Found NI = Traffic NO = Not Opened SD = Surcharged/Debris	<b>28 Location Code 2-11</b> A = Primary Major Arterial Road B = Secondary Road C = Local/Rural Street D = Easement/Right-of-Way E = Woods	<b>28 Location Code 2-11</b> F = Sidewalk G = Parking Lot H = Alley I = Ditch J = Building K = Creek (or any waterway)	<b>28 Location Code 2-11</b> L = Railway M = Airport N = Levee/Floodwall O = Dam P = Levee Pump Station Y = Yard Z = Other
<b>30 Pipe Use 2-12</b> CB = Combined Pipe DP = Dam Pipe FM = Force Main LG = Levee Gravity Pipe LP = Levee Pressure Pipe	<b>30 Pipe Use 2-12</b> PR = Process Pipe SS = Sanitary Sewage Pipe SW = Stormwater Pipe XX = Not Known ZZ = Other	<b>33 Shape 2-13 E-1</b> A = Arched B = Barrel C = Circular E = Egg-Shaped H = Horseshoe O = Oval (elliptical)	<b>33 Shape 2-13 E-1</b> R = Rectangular S = Square T = Trapezoidal U = U-Shaped with Flat Top Z = Other	<b>34 Material 2-14 E-4</b> ABS = Acrylonitrile Butadiene Styrene AC = Asbestos Cement BR = Brick CAS = Cast Iron CLC = Clay-Lined Concrete CMP = Corrugated Metal Pipe	<b>34 Material 2-14 E-4</b> CP = Concrete Pipe CSB = Conc. Segments Bolted CSU = Conc. Segments Unbolted CT = Clay Tile DIP = Ductile Iron Pipe
<b>34 Material 2-14 E-4</b> FRP = Fiberglass Reinforced Pipe OB = Orangeburg/Pitch Fiber PCCP = Pre-Stressed Concrete Cylinder Pipe PCP = Polymer Concrete Pipe PE = Polyethylene	<b>34 Material 2-14 E-4</b> PP = Polypropylene PSC = Plastic/Steel Composite PVC = Polyvinyl Chloride RCP = Reinf. Concrete Pipe RMP = Reinf. Plastic Pipe SB = Segmented Block	<b>34 Material 2-14 E-4</b> SP = Steel Pipe VCP = Vitrified Clay Pipe WD = Wood XXX = Not Known ZZZ = Other	<b>35 Lining Method 2-15 E-17</b> CIP = Cured-In-Place Pipe FF = Fold and Form FP = Formed-In-Place Liner GP = Grout-In-Place Liner GRC = Glass Reinf. Cement N = None SC = Continuous Slip Liner	<b>35 Lining Method 2-15 E-17</b> SE = Sectional Slip Liner SL = Spray Liner SN = Segmented Panel SP = Segmented Pipe SW = Spiral Wound XX = Not Known ZZ = Other	<b>36 Coating Method 2-16 E-23</b> CT = Coal Tar CM = Cement Mortar EP = Epoxy PE = Polyethylene
<b>36 Coating Method 2-16 E-23</b> PO = Polyurethane PU = Polyurea PVC = Polyvinyl Chloride XX = Not Known ZZ = Other	<b>58 GPS Accuracy 2-27</b> L = Survey Level M = Sub-Meter N = Nearest Meter				



### Appendix B - Color Coded Chart



REPLACEMENT FUND WORKSHEET  
 BLUE TOWNSHIP SEWER POTTAWATOMIE COUNTY KANSAS  
 BG PROJECT NO. 17-1155M

Item	Description	Quantity	Unit	Sewer Main	Approx.	Useful	Remaining	Rehab/Replace	Total	20-Year	Notes
				Unit Cost	Install Date	Life	Life	Total Cost	Annual Cost	Prorated Cost	
1	Manholes	402	EA	\$ 1,500.00	2000	50	32	\$ 603,000.00	\$ 18,843.75	\$ 11,777.34	Entire System
2	6" Sewer Main	1680	LF	\$ 30.00	1985	75	42	\$ 50,400.00	\$ 1,200.00	\$ 571.43	
3	8" Sewer Main PVC	71905	LF	\$ 30.00	1990	100	72	\$ 2,157,150.00	\$ 29,960.42	\$ 8,322.34	
4	8" Sewer Main Truss	8475	LF	\$ 30.00	1975	65	22	\$ 254,250.00	\$ 11,556.82	\$ 10,506.20	Timber Creek 1 Subdivision
5	10" Sewer Main	9810	LF	\$ 30.00	1980	100	62	\$ 294,300.00	\$ 4,746.77	\$ 1,531.22	
6	12" Sewer Main	4200	LF	\$ 42.00	2010	100	92	\$ 176,400.00	\$ 1,917.39	\$ 416.82	
7	18" Sewer Main	6880	LF	\$ 90.00	2015	100	97	\$ 619,200.00	\$ 6,383.51	\$ 1,316.19	
8	21" Sewer Main	750	LF	\$ 150.00	2015	100	97	\$ 112,500.00	\$ 1,159.79	\$ 239.13	
9	24" Sewer Main	1600	LF	\$ 200.00	2015	100	97	\$ 320,000.00	\$ 3,298.97	\$ 680.20	
10	27" Sewer Main	210	LF	\$ 250.00	2015	100	97	\$ 52,500.00	\$ 541.24	\$ 111.60	
11	30" Sewer Main	60	LF	\$ 300.00	2015	100	97	\$ 18,000.00	\$ 185.57	\$ 38.26	
12	1.5" Forcemain	1315	LF	\$ 20.00	1985	100	67	\$ 26,300.00	\$ 392.54	\$ 117.18	
13	4" Forcemain	2730	LF	\$ 30.00	2000	100	82	\$ 81,900.00	\$ 998.78	\$ 243.60	Whispering Meadows and Green Valley Bore
14	6" Forcemain	1560	LF	\$ 40.00	2000	100	82	\$ 62,400.00	\$ 760.98	\$ 185.60	Eagles Landing
15	8" Forcemain	3950	LF	\$ 50.00	2005	100	87	\$ 197,500.00	\$ 2,270.11	\$ 521.87	Elbo Creek Estates and Green Valley Road
16	14" Forcemain	12650	LF	\$ 125.00	2012	100	94	\$ 1,581,250.00	\$ 16,821.81	\$ 3,579.11	To WWTF
17	LS Eagles Landing										Duplex Vacuum Prime Lift Station
	Pumps - Misc.	1	LS	\$ 75,000.00	2001	25	8	\$ 75,000.00	\$ 9,375.00	\$ 9,375.00	3 HP 3 Phase 230V 1606993
	Controls	1	LS	\$ 15,000.00	2001	25	8	\$ 15,000.00	\$ 1,875.00	\$ 1,875.00	
	Generator	1	LS	\$ 25,000.00	2016	25	23	\$ 25,000.00	\$ 1,086.96	\$ 1,086.96	
18	LS Timber Creek										Duplex Vacuum Prime Lift Station
	Pumps - Misc.	1	LS	\$ 85,000.00	1999	25	6	\$ 85,000.00	\$ 14,166.67	\$ 14,166.67	5 HP 3 phase 230V 16-6512
	Controls	1	LS	\$ 15,000.00	1999	25	6	\$ 15,000.00	\$ 2,500.00	\$ 2,500.00	
	Generator	1	LS	\$ 25,000.00	2016	25	23	\$ 25,000.00	\$ 1,086.96	\$ 1,086.96	
19	LS Elbo Creek West 2 (7.5 HP)										Duplex Vacuum Prime Lift Station
	Pumps - Misc.	1	LS	\$ 85,000.00	2008	25	15	\$ 85,000.00	\$ 5,666.67	\$ 5,666.67	7.5 HP 3 phase 230V 168467
	Controls	1	LS	\$ 25,000.00	2008	25	15	\$ 25,000.00	\$ 1,666.67	\$ 1,666.67	
	Generator	1	LS	\$ 40,000.00	2005	25	12	\$ 40,000.00	\$ 3,333.33	\$ 3,333.33	
20	LS Excel South (2HP)										Simplex Grinder Station
	Pumps - Misc.	1	LS	\$ 10,000.00	2008	25	15	\$ 10,000.00	\$ 666.67	\$ 666.67	
	Controls	1	LS	\$ 5,000.00	2008	25	15	\$ 5,000.00	\$ 333.33	\$ 333.33	
	Generator	1	LS	\$ 25,000.00	2018	25	25	\$ 25,000.00	\$ 1,000.00	\$ 1,000.00	
21	Blue Township Lift Station *										Duplex Dry Pit Submersible Lift Station
	Pumps - Misc.	1	LS	\$ 100,000.00	2011	25	18	\$ 100,000.00	\$ 5,555.56	\$ 5,555.56	75HP
	Headworks	1	LS	\$ 80,000.00	2011	25	18	\$ 80,000.00	\$ 4,444.44	\$ 4,444.44	
	Controls	1	LS	\$ 20,000.00	2011	25	18	\$ 20,000.00	\$ 1,111.11	\$ 1,111.11	
	Generator	1	LS	\$ 40,000.00	2011	25	18	\$ 40,000.00	\$ 2,222.22	\$ 2,222.22	

\* - Amounts reflected are 2/3 of estimated replacement cost. City of Manhattan pays 1/3.

22	Administrative Items										
	CCTV *	2	LS	\$ 150,000.00			20	\$ 300,000.00	\$ 15,000.00	\$ 15,000.00	
	SSES	1	LS	\$ 15,000.00			20	\$ 15,000.00	\$ 750.00	\$ 750.00	
	MH Inspection Program	1	LS	\$ 18,000.00			20	\$ 18,000.00	\$ 900.00	\$ 900.00	

\* - Amounts reflect full system cleanings in the planning period

Total Annual Prorated Cost \$ 112,898.66  
 Service Connections 1280  
 Monthly Service Connection Assessment \$ 7.35

Year	2018	2019	2020	2021	2022
Annual Replacement Fund	\$112,899	\$117,400	\$122,100	\$127,000	\$132,100
Connections	1280	1340	1400	1460	1520
Monthly Rate	\$7.35	\$7.30	\$7.27	\$7.25	\$7.24

Notes  
 Increase 4% annually  
 Increase 60 connections per year