

APPENDIX 1

NASSCO PIPELINE ASSESSMENT CERTIFICATION
PROGRAM (PACP)

GRADE INDEX SCORES FOR PIPE CONDITIONS

5: Immediate attention needed

4: Poor, will likely become Grade 5 in the near future

3: Fair; moderate

2: Good; has not begun to deteriorate

1: Excellent; minor defects



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

Section 4 — Structural Defect Coding

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



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Section 5 — Operation and Maintenance

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

Section 6 — Construction Features

T TAP 6-3 TB Break-In/Hammer TBI Intruding TBD Defective TBC Capped TBA Activity TBB Abandoned	T TAP 6-3 TF Factory Made TFI Intruding TFD Defective TFC Capped TFA Activity TFB Abandoned	T TAP 6-3 TR Rehabilitated TRI Intruding TRD Defective TRC Capped TRA Activity TRB Abandoned	T TAP 6-3 TS Saddle TSI Intruding TSD Defective TSC Capped TSA Activity TSB Abandoned	IS INTRUDING SEALING MATERIAL 6-15 ISSR Sealing Ring ISSRB Broken ISSRH Hanging ISSRL Loose ISGT Grout ISZ Other	M MISCELLANEOUS FEATURES 7-1 MCU Camera Underwater MGO General Observation MGP General Photograph MJL Joint Length	
L LINE 6-21 (of sewer) LD Down LL Left LLD Left Down LLU Left Up	L LINE 6-21 (of sewer) LR Right LRD Right Down LRU Right Up LU Up	A ACCESS POINT 6-25 ACB Catch Basin ACO Cleanout ACOM Mainline ACOP Property ACOH House	A ACCESS POINT 6-25 ADP Discharge Point AEP End of Pipe AJB Junction Box AM Meter AMH Manhole	A ACCESS POINT 6-25 AOC Other Structure ATC Tee Connection AWA Wastewater Access AWW Wetwell AZ Other	M MISCELLANEOUS FEATURES 7-1 MLC Lining Change MMC Material Change MSC Shape/Size Change MSA Survey Abandoned MWL Water Level	M MISCELLANEOUS FEATURES 7-1 MWLS Water Level Sag MWM Water Mark MY Dye Test MYV Dye Visible MYN Not Visible

Section 7 — Miscellaneous Features



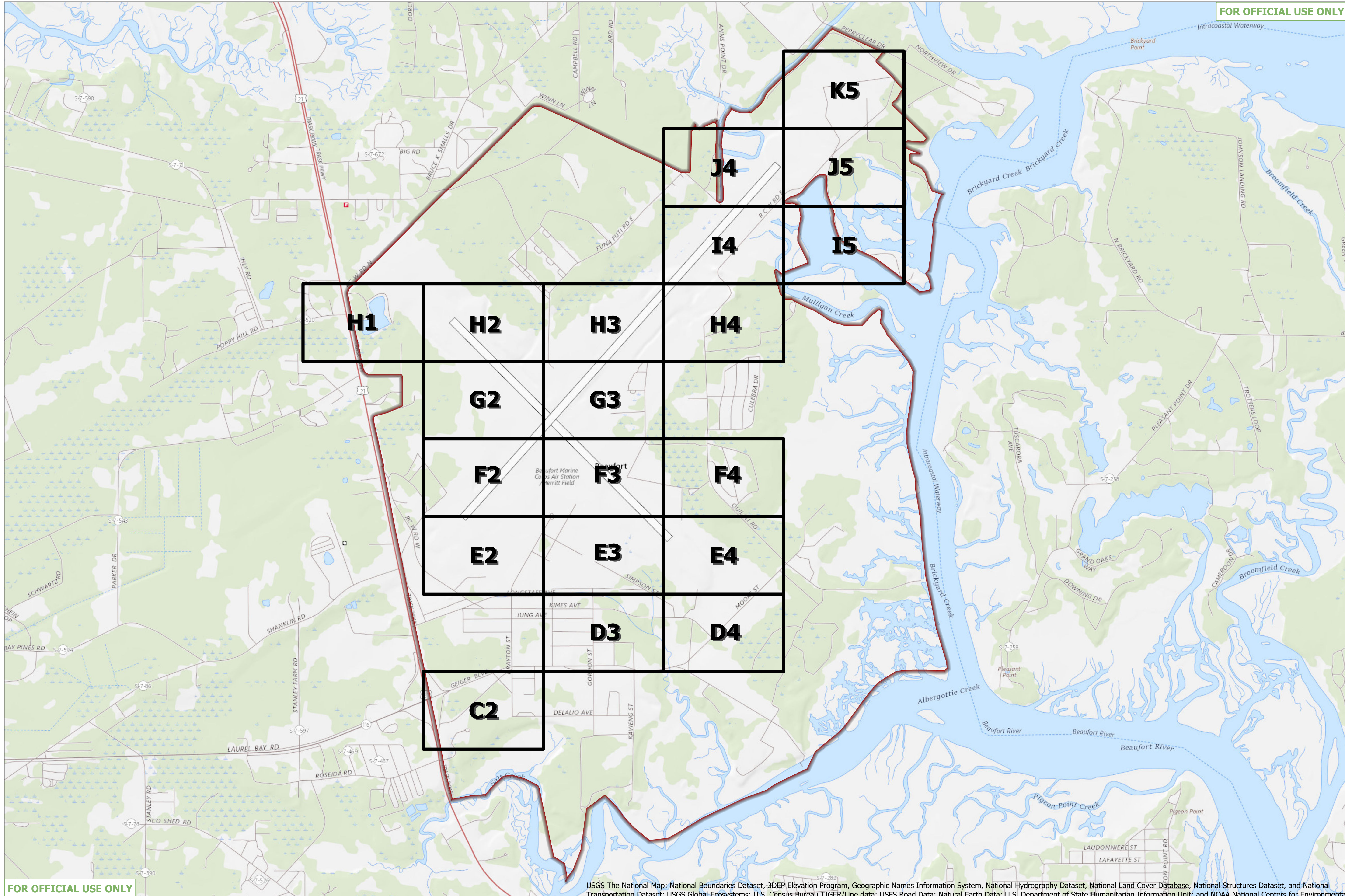
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Section 2 — Header Form Fields

14 Weather 2-5 1 = Dry 2 = Heavy Rain 3 = Light Rain 4 = Snow 5 = Dry Weather/Wet Ground	15 Pre-Cleaning 2-5 H = Heavy Cleaning L = Light Cleaning (Jetting) N = No Pre-Cleaning X = Not Known Z = Other	17 Flow Control 2-6 B = Bypassed D = Dewatered Using Jetter L = Lift Station N = Not Controlled P = Plugged	18 Purpose 2-7 A = Maintenance B = Infiltration/Inflow Invest. C = Post-Rehabilitation D = Pre-Rehabilitation E = Pre-Acceptance F = Routine Assessment	18 Purpose 2-7 G = Capital Improvement Program Assessment H = Resurvey I = SSES R = Pre-Existing Video X = Not Known	19 Direction 2-7 D = Downstream U = Upstream
20 Inspection Technology 2-8 CC = CCTV LA = Laser SO = Sonar SS = Sidewall Scanning ZM = Zoom ZZ = Other	21 Inspection Status 2-8 BM = Buried & Marked CI = Complete Inspection NA = No Access NE = Does Not Exist	21 Inspection Status 2-8 NF = Not Found NI = Traffic NO = Not Opened SD = Surcharged/Debris	28 Location Code 2-11 A = Primary Major Arterial Road B = Secondary Road C = Local/Rural Street D = Easement/Right-of-Way E = Woods	28 Location Code 2-11 F = Sidewalk G = Parking Lot H = Alley I = Ditch J = Building K = Creek (or any waterway)	28 Location Code 2-11 L = Railway M = Airport N = Levee/Floodwall O = Dam P = Levee Pump Station Y = Yard Z = Other
30 Pipe Use 2-12 CB = Combined Pipe DP = Dam Pipe FM = Force Main LG = Levee Gravity Pipe LP = Levee Pressure Pipe	30 Pipe Use 2-12 PR = Process Pipe SS = Sanitary Sewage Pipe SW = Stormwater Pipe XX = Not Known ZZ = Other	33 Shape 2-13 E-1 A = Arched B = Barrel C = Circular E = Egg-Shaped H = Horseshoe O = Oval (elliptical)	33 Shape 2-13 E-1 R = Rectangular S = Square T = Trapezoidal U = U-Shaped with Flat Top Z = Other	34 Material 2-14 E-4 ABS = Acrylonitrile Butadiene Styrene AC = Asbestos Cement BR = Brick CAS = Cast Iron CLC = Clay-Lined Concrete CMP = Corrugated Metal Pipe	34 Material 2-14 E-4 CP = Concrete Pipe CSB = Conc. Segments Bolted CSU = Conc. Segments Unbolted CT = Clay Tile DIP = Ductile Iron Pipe
34 Material 2-14 E-4 FRP = Fiberglass Reinforced Pipe OB = Orangeburg/Pitch Fiber PCCP = Pre-Stressed Concrete Cylinder Pipe PCP = Polymer Concrete Pipe PE = Polyethylene	34 Material 2-14 E-4 PP = Polypropylene PSC = Plastic/Steel Composite PVC = Polyvinyl Chloride RCP = Reinf. Concrete Pipe RMP = Reinf. Plastic Pipe SB = Segmented Block	34 Material 2-14 E-4 SP = Steel Pipe VCP = Vitrified Clay Pipe WD = Wood XXX = Not Known ZZZ = Other	35 Lining Method 2-15 E-17 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	35 Lining Method 2-15 E-17 SE = Sectional Slip Liner SL = Spray Liner SN = Segmented Panel SP = Segmented Pipe SW = Spiral Wound XX = Not Known ZZ = Other	36 Coating Method 2-16 E-23 CT = Coal Tar CM = Cement Mortar EP = Epoxy PE = Polyethylene
36 Coating Method 2-16 E-23 PO = Polyurethane PU = Polyurea PVC = Polyvinyl Chloride XX = Not Known ZZ = Other	58 GPS Accuracy 2-27 L = Survey Level M = Sub-Meter N = Nearest Meter				

APPENDIX 2

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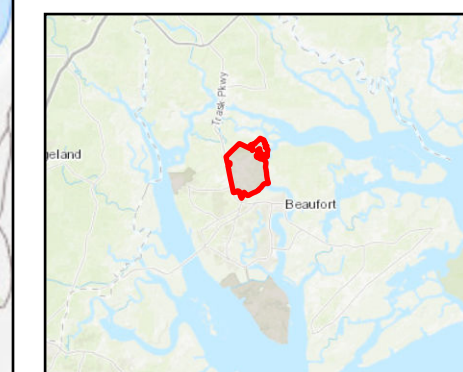
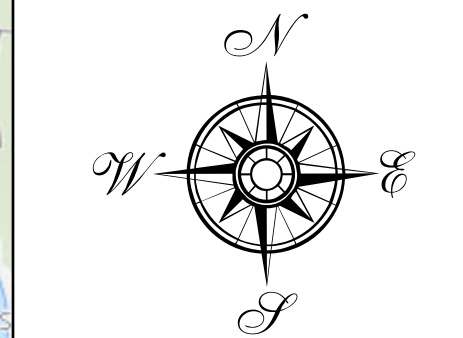
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USGS The National Map; National Boundaries Dataset; 3DEP Elevation Program; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental

MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
Index Map

MCAS Beaufort
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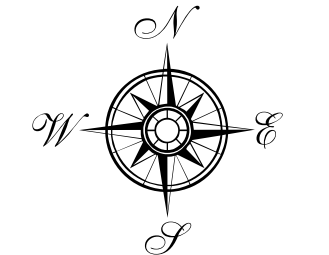
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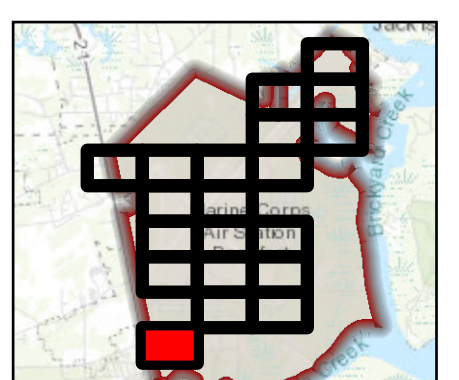
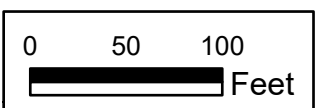
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MCAS Beaufort Stormwater Repair (Existing Conditions)

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C2



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



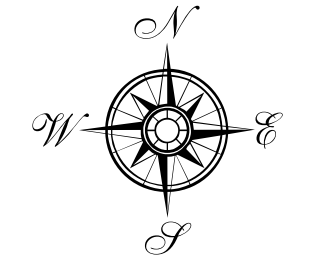
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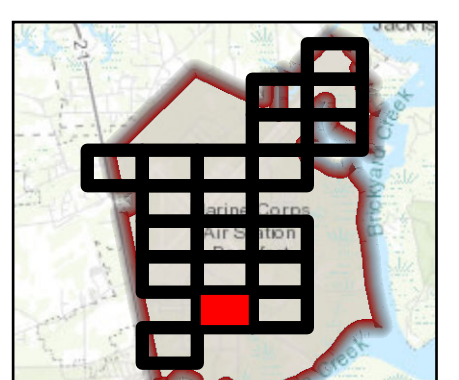
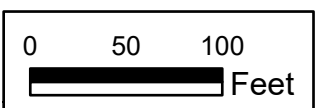
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
D3



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



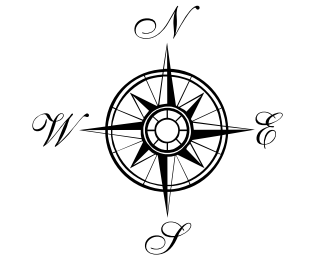
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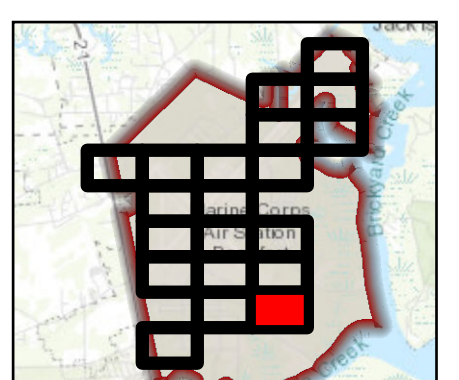
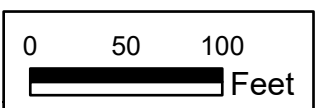
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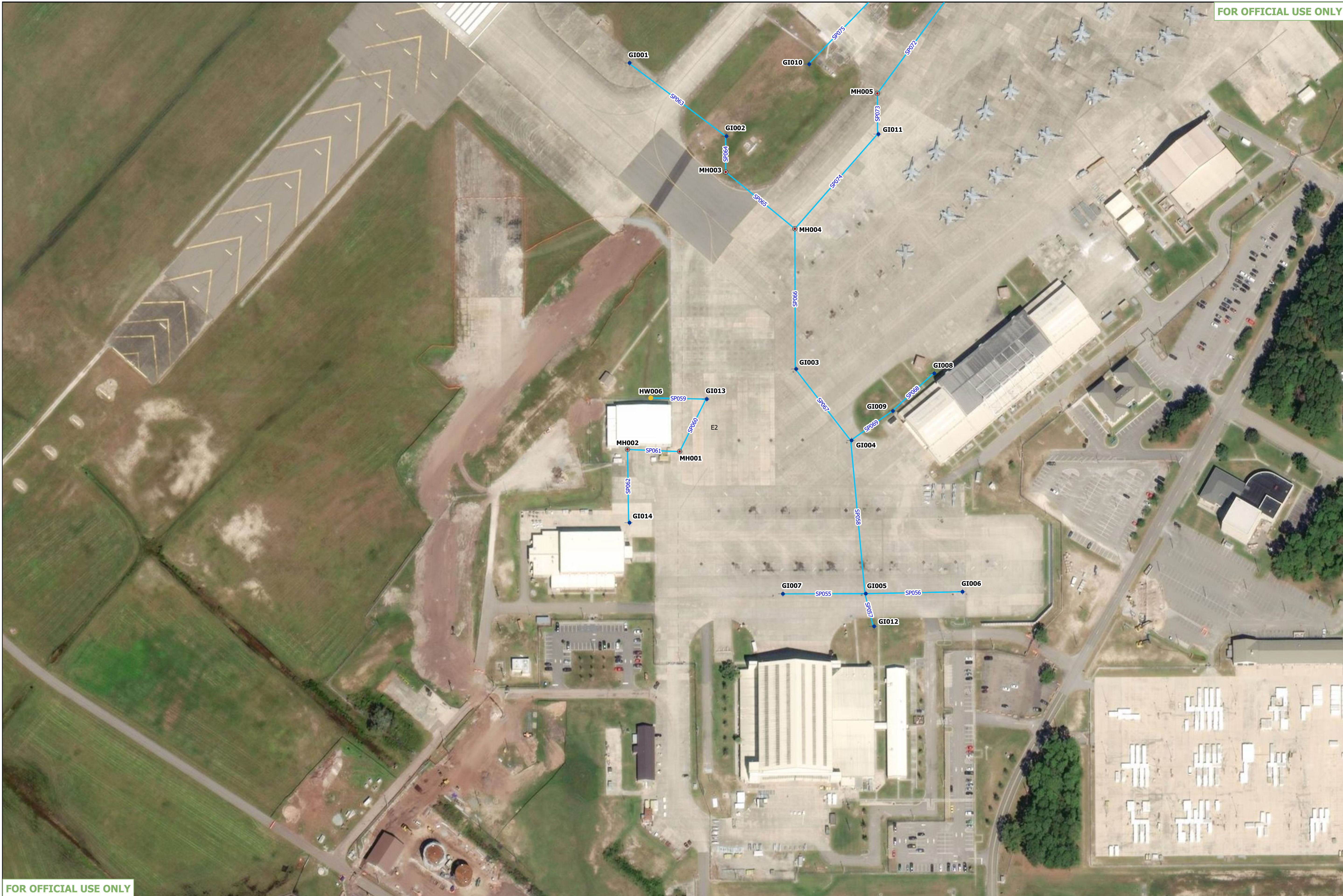
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- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



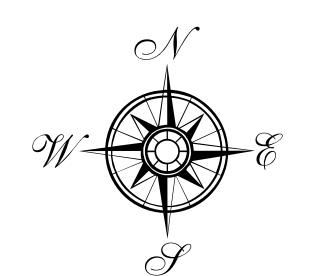
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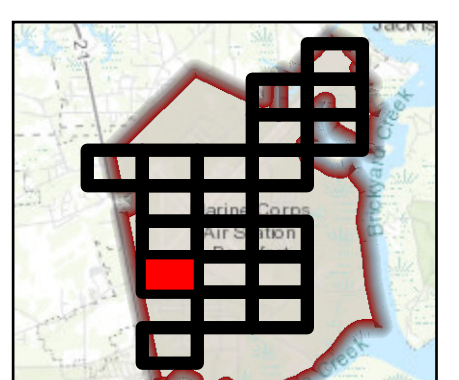
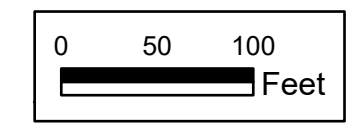
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
E2



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - ⊗ Storm Sewer Junction
 - ⊗ Stormwater Valve



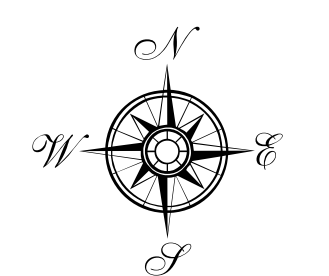
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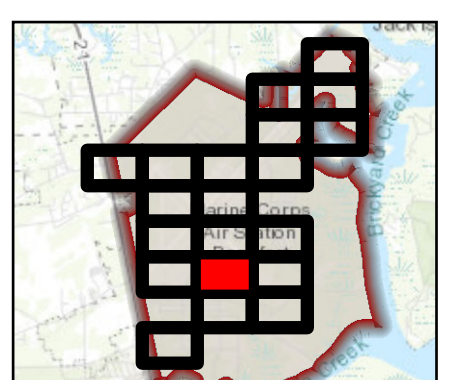
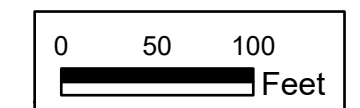
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
E3



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve

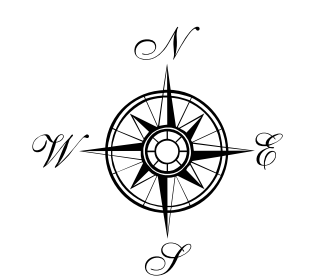


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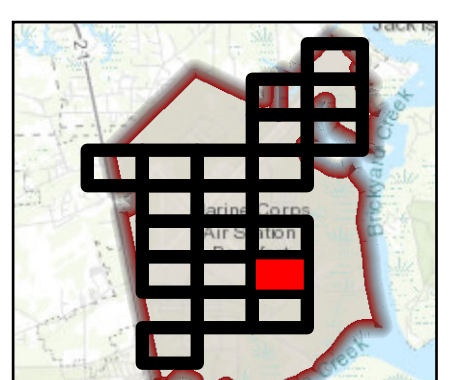
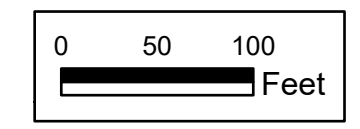


MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
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- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - ⊗ Storm Sewer Junction
 - ⊗ Stormwater Valve



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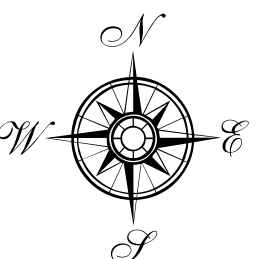


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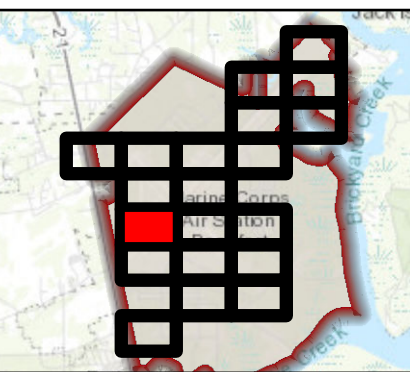
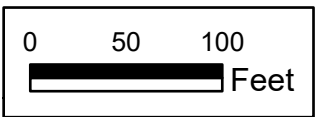
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
F2



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve

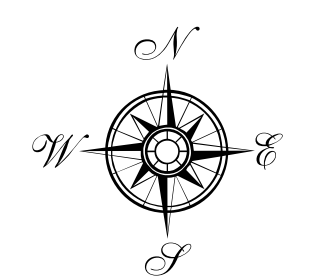


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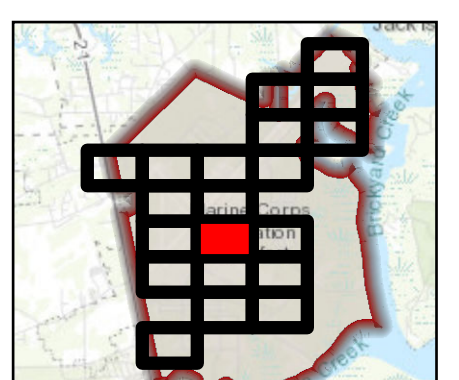
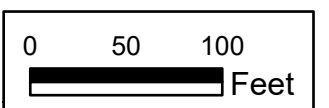
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
F3



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



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GI073 is located here

This section does not exist

In new construction area; demolished

In new construction area; demolished

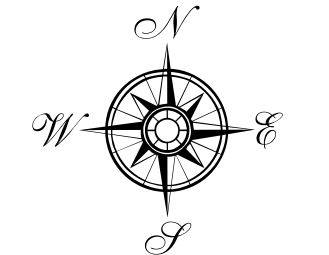
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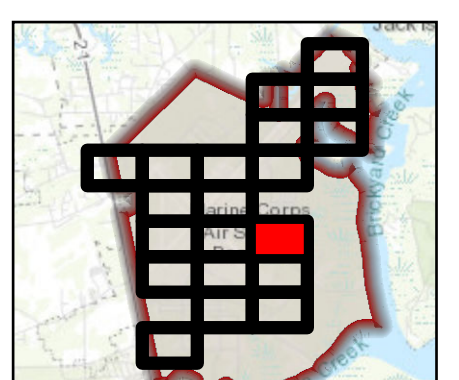
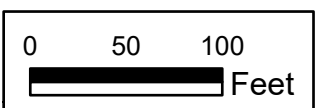
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
F4



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



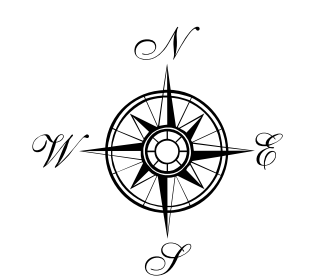
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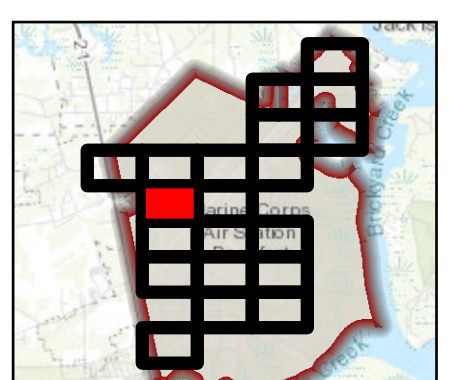
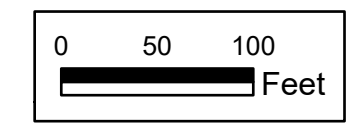
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
G2



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



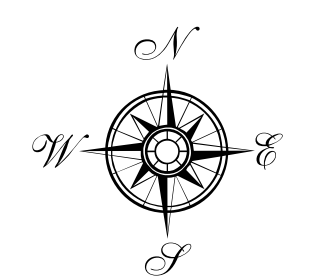
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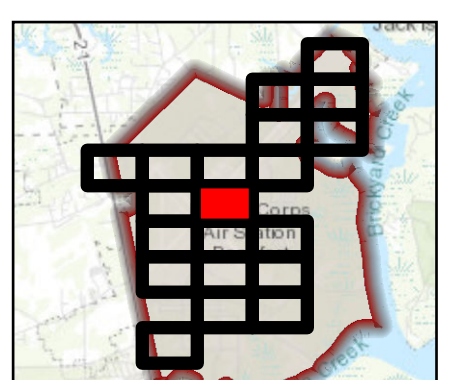
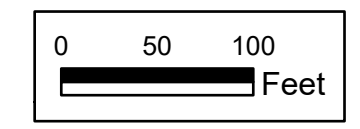
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
G3



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - ◆ Storm Sewer Inlet
 - ⊗ Storm Sewer Junction
 - ⊙ Stormwater Valve



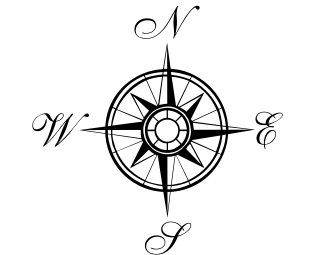
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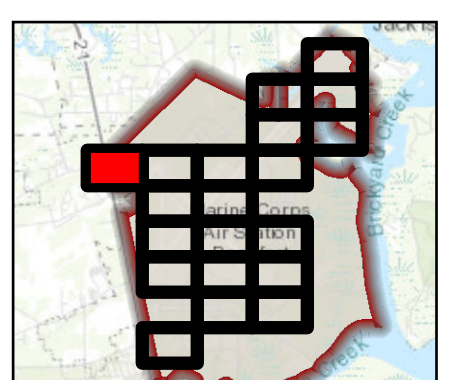
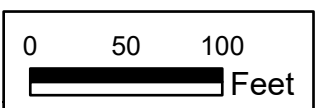
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
H1



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



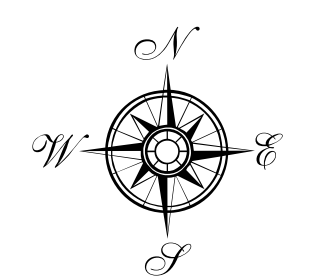
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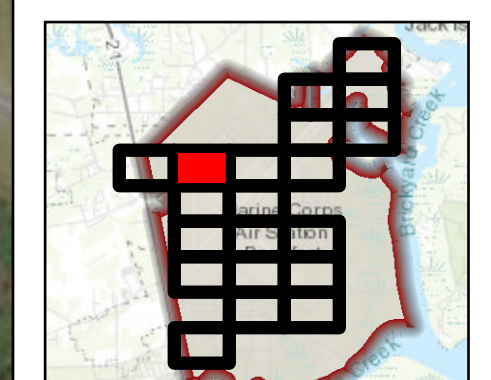
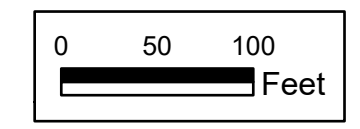
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
H2



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



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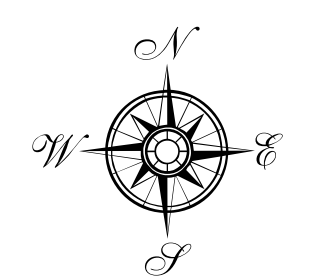


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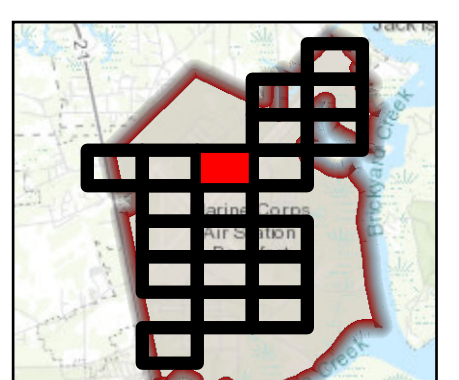
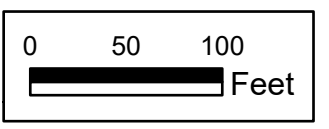
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
H3



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - ⊙ Storm Sewer Junction
 - ⊙ Stormwater Valve



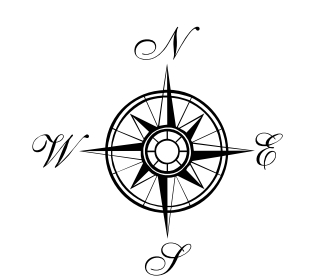
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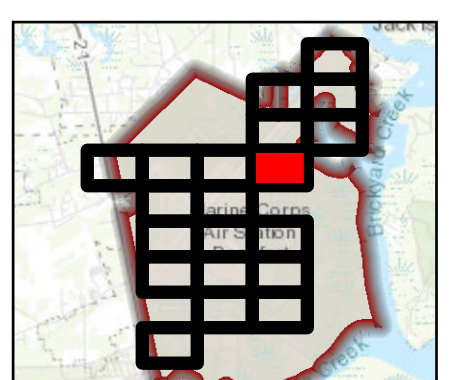
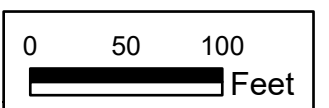
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
H4



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



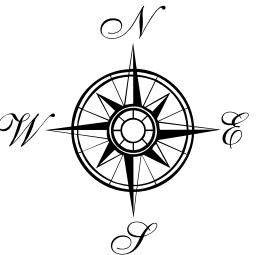


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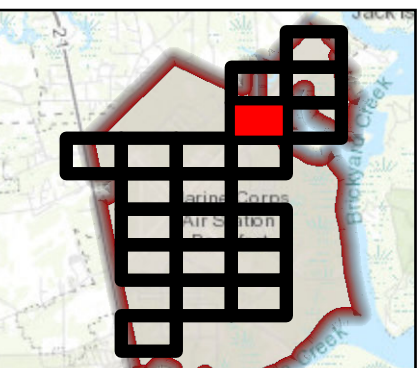
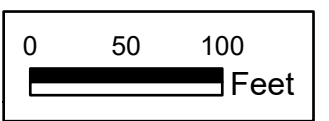
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
I4



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



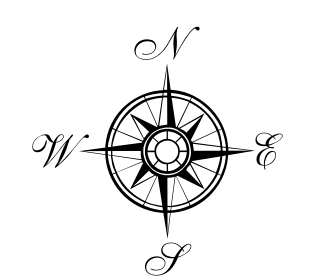
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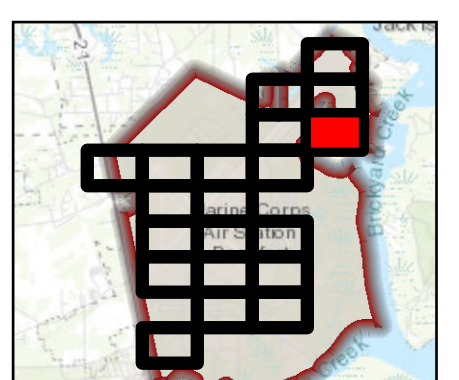
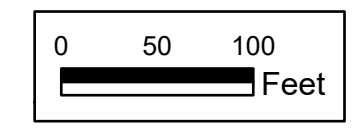
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
15



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



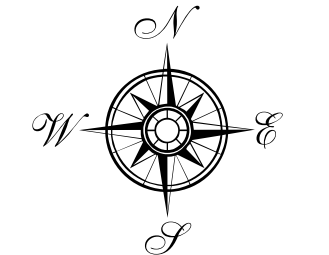
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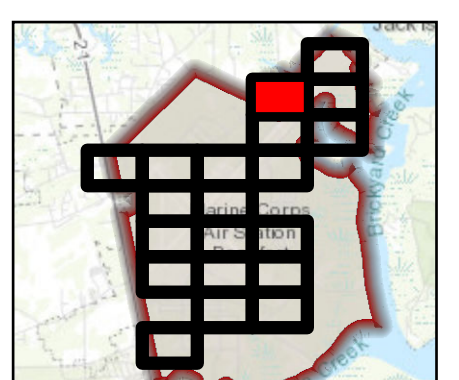
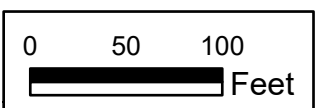
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
J4



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - ◆ Storm Sewer Inlet
 - ⊗ Storm Sewer Junction
 - ⊙ Stormwater Valve



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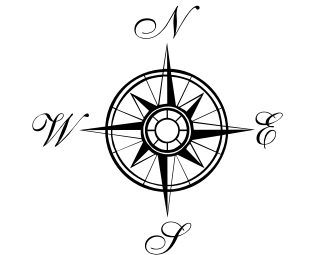


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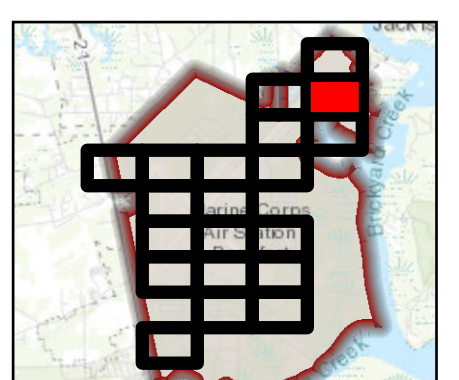
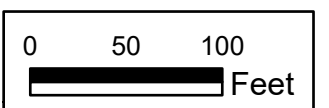
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
J5



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve



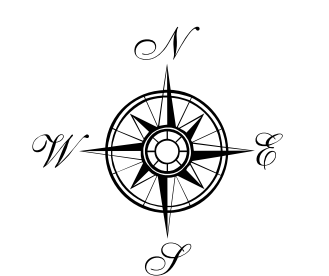
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MCAS Beaufort Stormwater Repair (Existing Conditions)

Sheet Name:
K5



- Legend
- Storm Culvert
 - Storm Sewer Headwall
 - Storm Sewer Inlet
 - Storm Sewer Junction
 - Stormwater Valve

