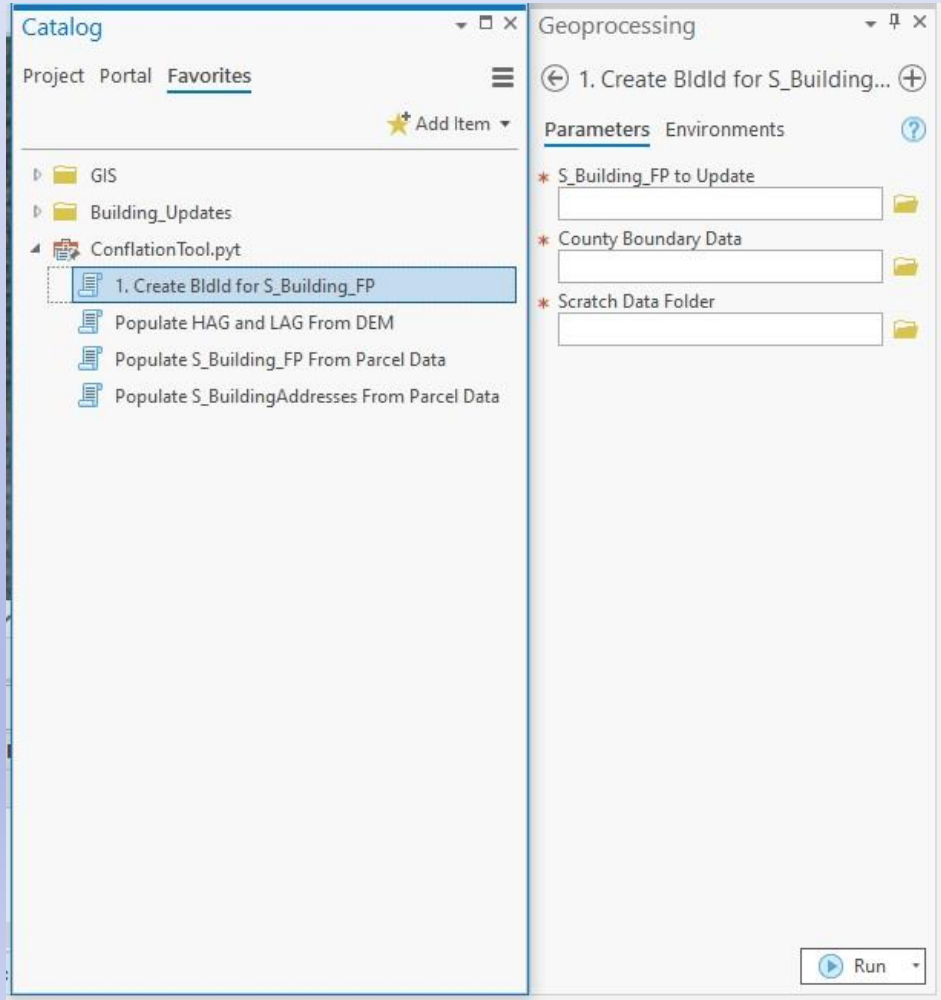
NC Emergency Management
(Risk) Building Footprint Project

Daniel Madding

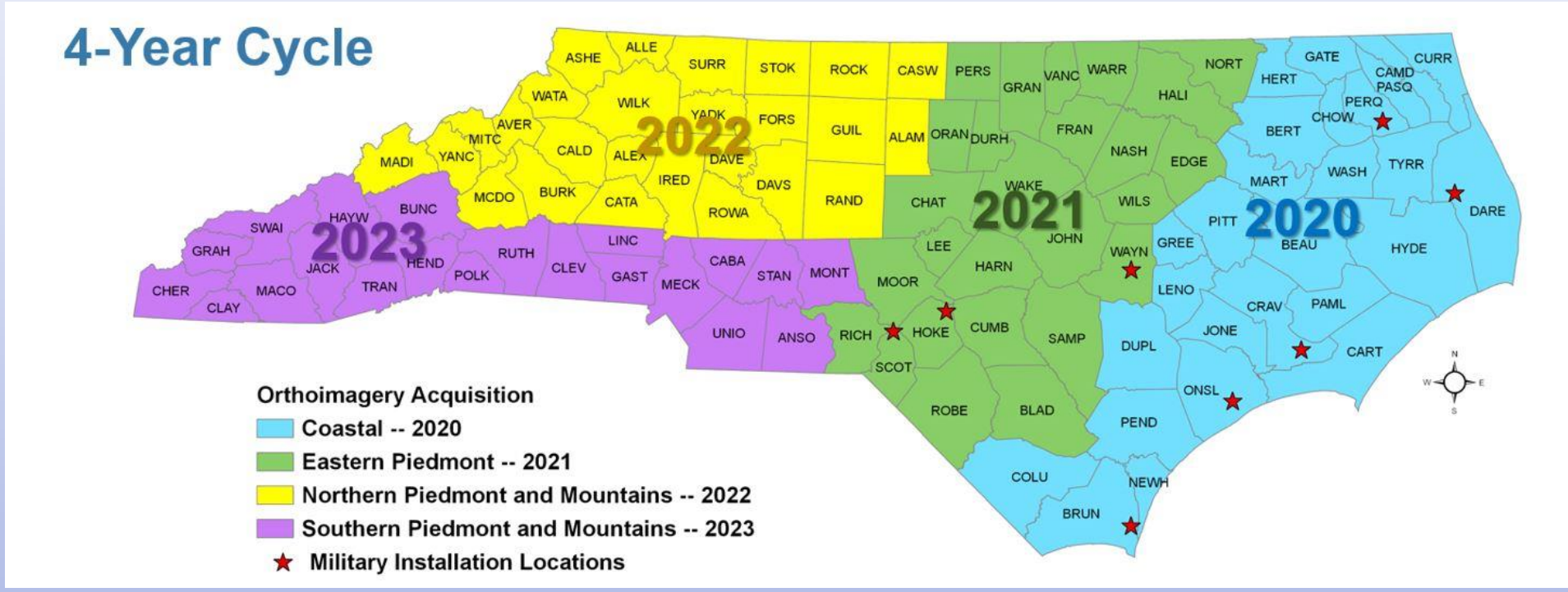
2020 Building Footprint Update Project

Composite dataset:

20 Counties' BF data, LiDAR extracted structures, Ag's Phase 1-3 building data, NSI, and the (2019) Microsoft Open Street data



BF Geometries Maintenance plan
Update 25 counties annually



As of Oct 1 2022 NCEM GIS has 22/27 counties completed
ETA for the remaining 5 is end of this year

Have new Temp working on 2021
ETA is 11 months

“Risk” Building Footprints

Includes around 4.9 million buildings

Original data was created between 2009-2012

Field Collection

First Floor Elevation

Foundation Type

Roof Shape

Roof Slope

Number of Stories

Parcel Conflation

Occupancy Type

Building Value

Year Built

Heated Sq Ft

Roof Shape

HAZUS Block Conflation

Roof Cover Type

Roof Cover Quality

Water Resistance

Roof Deck Attachment

Roof Deck Age

Roof Wall Connection

Roof Frame Type

Hurricane Shutters

Roof Tie Downs

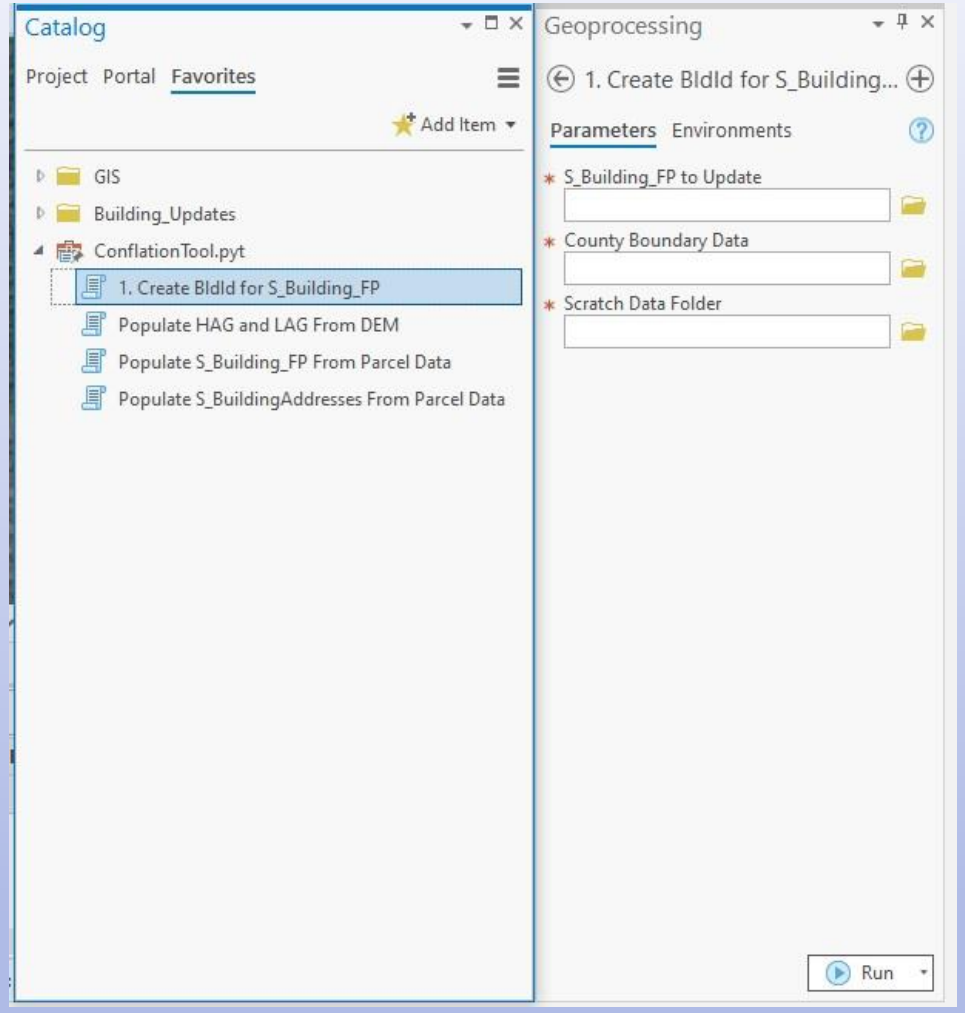
Window Area

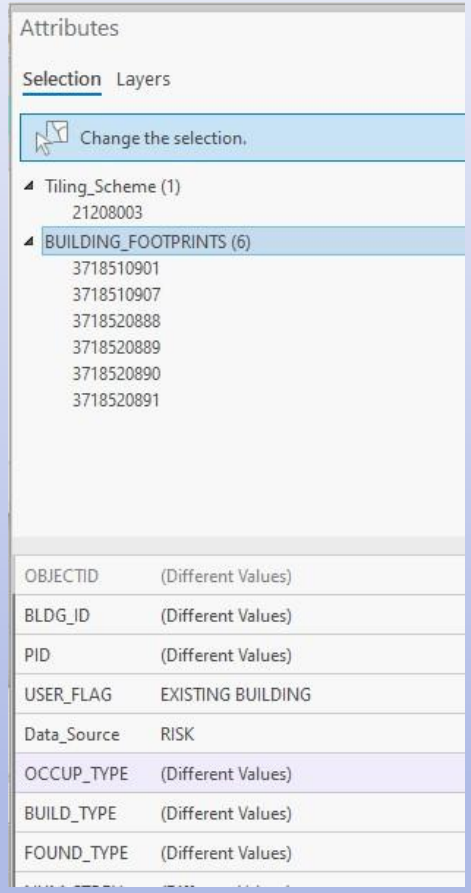
Masonry Reinforcing

Joist Spacing

Number of Units

EM's Conflation Tool + Pro's Attribute tool





Selection: Select By Attributes Zoom To Switch Clear Delete Copy Highlighted: Unselect Reselect Zoom To Switch Clear Delete

BLDG_ID	PID	USER_FLAG	Data_Source	OCCUP_TYPE	BUILD_TYPE	FOUND_TYPE	NUM_STORY
3718519...	2978-00-4675	EXISTING BUILDING	RISK	CHURCH/NON-PROFIT	CONCRETE	SLAB ON GRADE	2 FLOORS

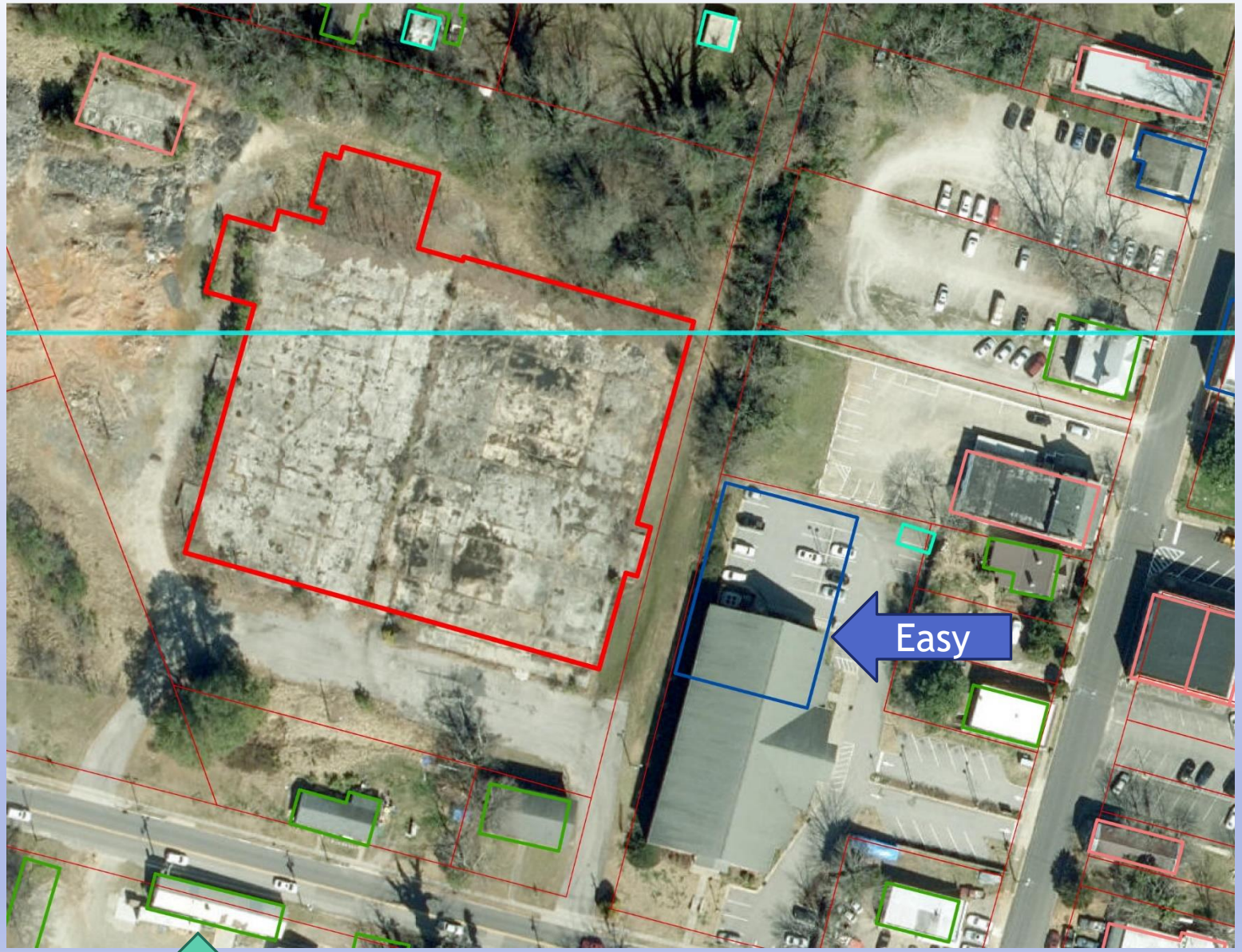
Buildings over parcel lines are tough to automate and case problems

10% rule = no edits

Parcels show buildings here – not roof

Automate this!

Why keep it?



Left your trailer on the side of the road?

Bad Automation (15%) takes time and QC

Understanding “Risk” BF attributes

Collect detail First Floor Elevations for all structures (Inclinometer for structures w/in the 500-year + SFHA.

LiDAR –HAG & LAG for all structures outside the 500-year SFHA).

S_BUILDINGS_FP

A polygon feature class representing building footprints and associated risk assessment data collected or derived as part Management Study Projects

Field	Data Type	Length	Precision	Scale	Description	Required		
BLDG_ID	Text	25			Primary key. Defined by mapping contractor using the formula STFIPS + COFIPS + DATE + SEQUENTIAL NUMBER (where date = YYYYMMDD).	Yes		
PID	Text	35			Tax Parcel Identification Number.	Yes		
BLOCK_ID	Text	25			Census Block Identification Number.	Yes		
OCCUP_TYPE	Text	45			HAZUS Building and Facilities Occupancy Type.	Yes		
BUILD_TYPE	Text	55			HAZUS Building Construction Type i.e. Wood, Steel, Concrete, etc...	Yes		
FLD_ZONE	Text	55			Flood Zone.	Yes		D_ZONE
YEAR_BUILT	Text	4			Year the structure was built.	Yes		
YRBUILTSRC	Text	35			Year Built Attribute Source.	Yes		D_YEAR_BUILT_SOURCE
BLDG_VALUE	Numeric		10	2	Building Value from parcel / tax records.	Yes		
BLDGREPVAL	Numeric		10	2	Building Replacement Value.	Yes		
HTD_SQ_FT	Long				Heated Square Footage.	Yes		
FFE	Numeric		10	2	First Floor Elevation.	Yes		
FFE_TYP	Text	40			Type of Survey used to obtain this FFE.	Yes		D_FFE_TYPE
LIDAR_LAG	Numeric		10	2	Lowest Adjacent Grade Derived from LiDAR.	Yes		
LIDAR_HAG	Numeric		10	2	Highest Adjacent Grade Derived from LiDAR.	Yes		
FOUND_TYPE	Text	55			Structure Foundation Type.	Yes		D_FOUNDATION_TYPE

Elevation Certificates

-FFE

-Foundation Types

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ○ Construction Drawings* ○ Building Under Construction* ◉ Finished Construction

* A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations: Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: VRS Vertical Datum: NAVD 88

Indicate elevation datum used for the elevations in items a) through h) below. ○ NGVD 1929 ◉ NAVD 1988

○ Other/Source:

Datum used for building elevations must be the same as that used for the BFE. Check the measurement used.

a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	6.8	◉ feet	○ meters
b) Top of the next higher floor	17.0	◉ feet	○ meters
c) Bottom of the lowest horizontal structural member (V Zones only)		◉ feet	○ meters
d) Attached garage (top of slab)	6.1	◉ feet	○ meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	11.7	◉ feet	○ meters
f) Lowest adjacent (finished) grade next to building (LAG)	6.1	◉ feet	○ meters
g) Highest adjacent (finished) grade next to building (HAG)	6.8	◉ feet	○ meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	6.6	◉ feet	○ meters

City **TOPSAIL TOWNSHIP** State **NC**

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
LOT 19 SLOOP PT PLANTATION PH 2 SEC 1 // PIN 42242398110000 // LOT 19 PLAT BOOK 40 PG 45

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)

A5. Latitude/Longitude: Lat. **34-24-41.6** Long. **-77-35-52.4** Horizontal Datum: ○ NAD 1927 ◉ NAD 1983

A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number **6**

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) **2118** sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade **12**

c) Total net area of flood openings in A8.b **2400 (see com)** sq in

d) Engineered flood openings? ◉ Yes ○ No

A9. For a building with an attached garage:

a) Square footage of attached garage **0** sq ft

b) Number of permanent flood openings in the at above a

c) Total ne

d) Enginee

Building Diagrams

DIAGRAM 7

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least 1 side is at or above grade. The principal use of this building is located in the elevated floors of the building.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

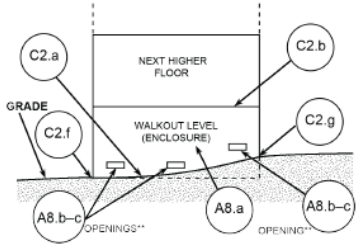
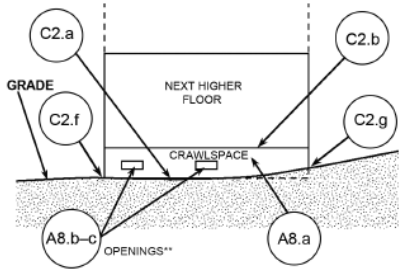


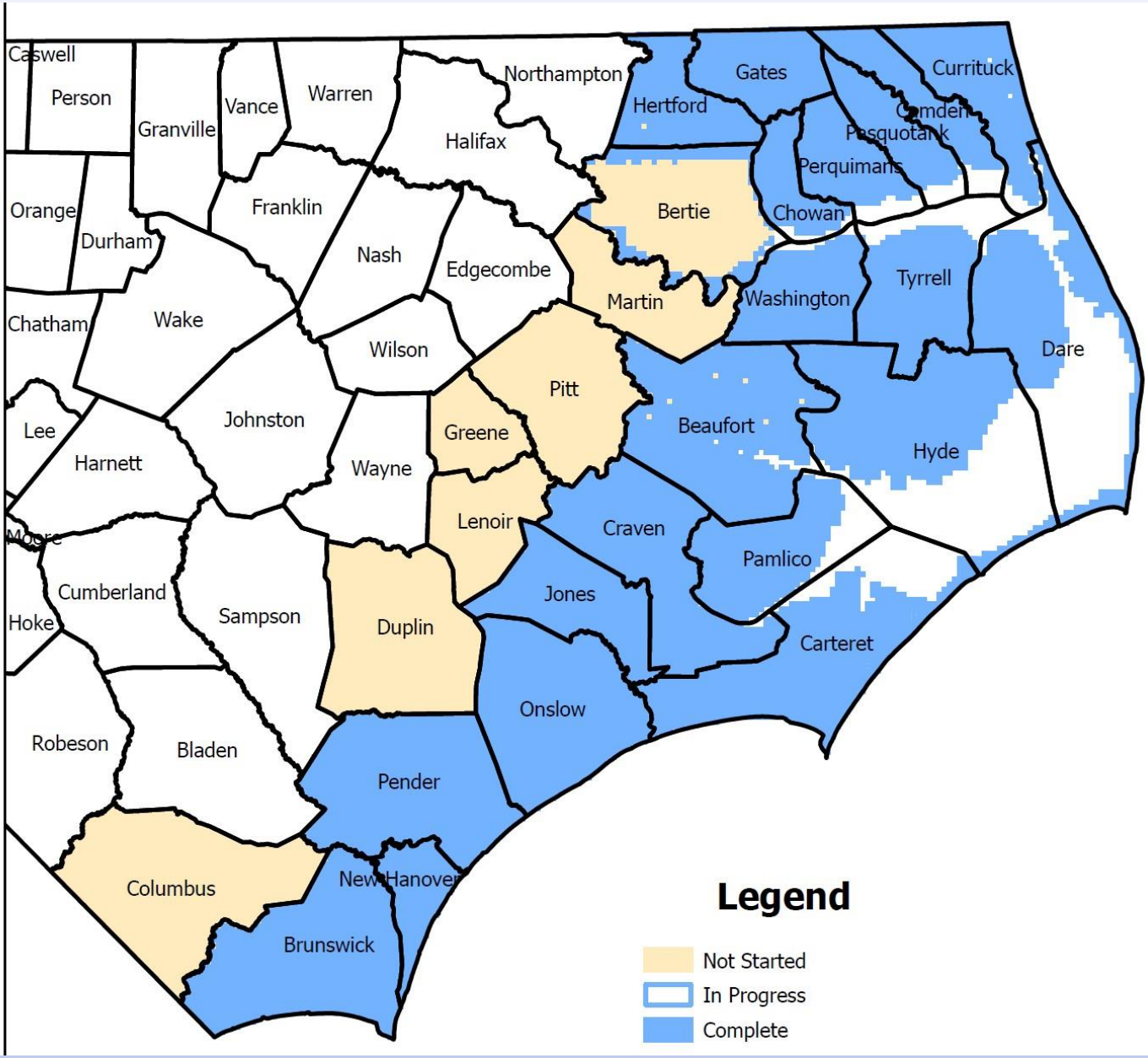
DIAGRAM 8

All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least 1 side, with or without an attached garage.

Distinguishing Feature – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings** present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.



Status of Building Footprints



Ready to share with counties for their QC

Bertie and Martin are complete

**In Summary, we are adding around ~15% new structures*

The 22 counties have ~800,000 structures now

Questions?

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