

Existing Conditions and Proposed Alternative Summary Meeting



Cedars East Drainage Improvement Project

Cokesbury United Methodist Church

June 25, 2013





Introduction of Staff

- **Charlotte-Mecklenburg Storm Water Services (CMSWS) Staff**

- **Matthew Anderson – Project Manager**
 - **Phone - 704-336-7923**
 - **E-mail - manderson@charlottenc.gov**
- **Doug Lozner – Watershed Area Manager**
- **Adrian Cardenas**

- **STV**

- **Edward Vance – Project Manager**
- **Steven Noriega – Senior Engineer**
- **Andre Mullins**
- **Matt Shosmith**

Housekeeping Items

- **Sign-In**
- **Customer Service Comment Cards**
- **General Question and Answer period after presentation**
- **Break out sessions with specific property questions**

Meeting Purpose and Agenda

- Purpose
 - Provide a summary of the Existing Conditions analysis
 - Provide a summary of the Alternatives Analysis and proposed improvements
 - Request input from property owners/residents on the proposed improvements
- Agenda
 - Charlotte-Mecklenburg Storm Water Services Summary
 - Project Selection and Citizen Involvement
 - Existing Conditions Analysis Summary
 - Alternatives Analysis and future project milestones
 - General Questions and Comments
 - Small Group Discussions

CMSWS Summary

Storm Water Program Roots:

1993 – Charlotte obtained and begin to comply with a NPDES Phase I permit. Charlotte established a storm water utility with a fee structure to fund NPDES required measures and to address drainage issues

What the program includes:

Water Quality

Maintenance

Capital Improvements

Education

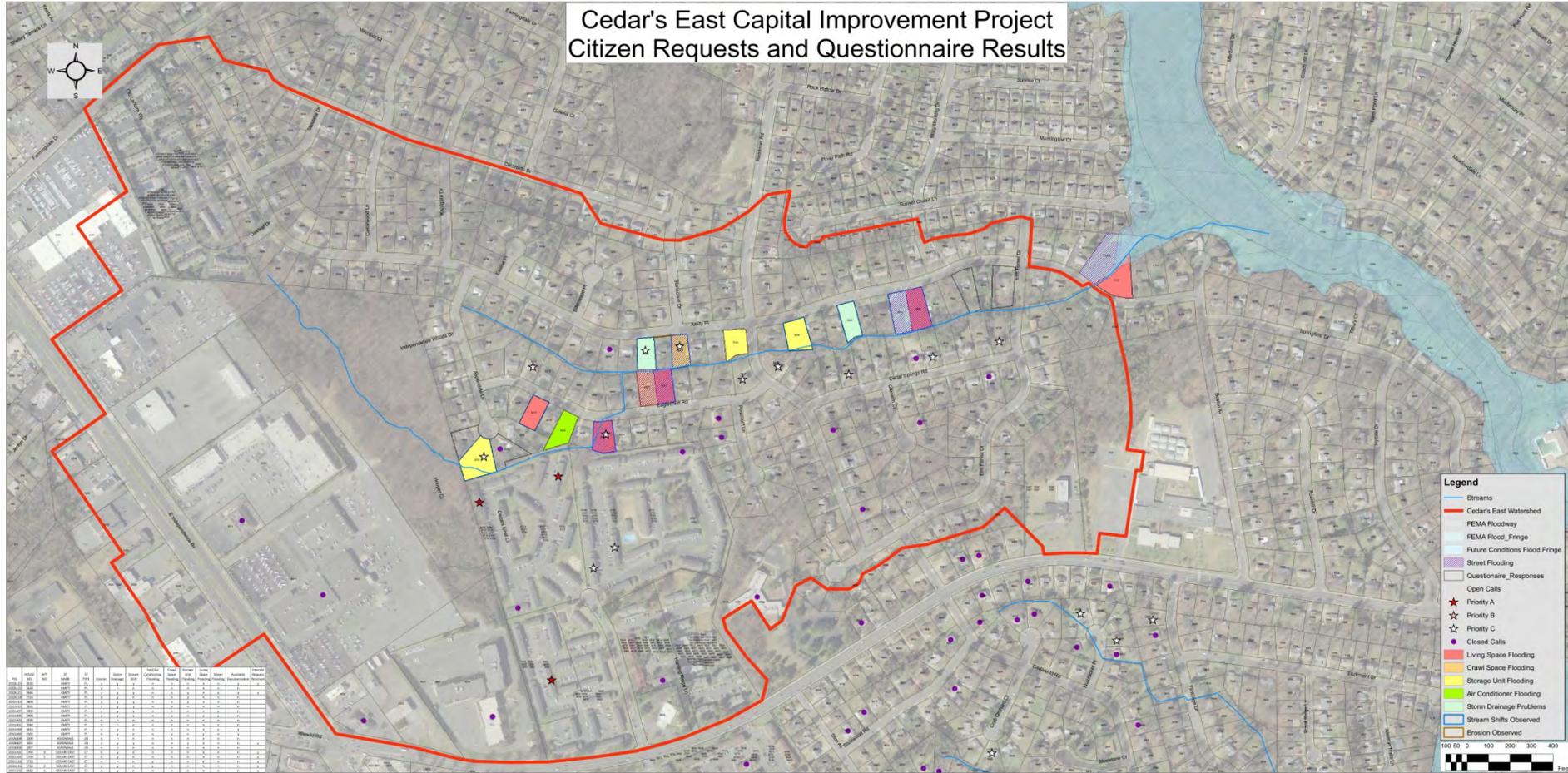


Citizen Involvement

- During the Project
 - Mailers Every Four Months and at Critical Stages
 - Website Updates: <http://charmeck.org/stormwater>
 - Questionnaires and Property Owner Surveys
 - Public Meetings
 - Email and Phone Contact as Needed
 - Customer Service Comment Cards

Citizen Involvement Exhibit

Cedar's East Capital Improvement Project
Citizen Requests and Questionnaire Results



Existing Conditions – Public Input

Neighborhood Critical Areas Correlation																	Appendix K-1	
Address or Request Location	Stormwater Issues Reported by Public								Stormwater Issues Confirmed by Modeling (6-Hour Balanced Storm Events - Storm frequency indicates event that causes problem)								Origination	
	Flooding Problems				Erosion Problems				Flooding Correlation				Erosion Correlation					
Based on 311 Requests or Questionnaires	Living Space	Crawl Space	HVAC	Storage	Yard	Storm Sewer Sys.	Yard	Bank/ Channel	Living Space	Crawl Space	HVAC	Storage	Lowest Adj. Grade	Storm Sewer Sys.	Yard	Bank/ Channel	311 Requests or Questionnaires	
5723 Cedars East Ct.																	3302284	
5723 Cedars East Ct. Apt. 2					Yes												11240	
5704 Cedars East Ct. Apt. 9																	3160816	
5709 Cedars East Ct. Apt. 1						Yes											2877766	
5723 Cedars East Ct. Apt. 2						Yes								02-year			5261	
5822 Cedars East Ct. Apt. 1						Yes											3148917	
5723 Cedars East Ct.						Yes											2449296	
5723 Cedars East Ct. Apt. 2						Yes											1125712	
5725 Cedars East Ct.	Yes					Yes											1113463	
5716 Cedars East Ct. Ex. Elev's (FFE, HVAC, etc.)	Yes		Yes		Yes	Yes			02-year 726.77		02-year 726.5			02-year	02-year		3813206	
3201 Aspendale Lane							Yes	Yes								02-year	813765	
3201 Aspendale Lane				Yes		Yes		Yes								02-year	Questionnaire	
3207 Aspendale Lane									No flooding/erosion issues reported								Questionnaire	
3200 Aspendale Lane									No flooding/erosion issues reported								Questionnaire	
6537 Eaglecrest Road					Yes	Yes		Yes						10-year			3147774	
6436 Eaglecrest Road					Yes	Yes								02-year	02-year		10131	
6412 Eaglecrest Road	Yes	Yes						Yes									Questionnaire	
6424 Eaglecrest Road			Yes						Area is outside detailed model area.								Questionnaire	
6436 Eaglecrest Road Ex. Elev's (FFE, HVAC, etc.)	Yes	Yes	Yes			Yes	Yes		No correlation predicted by model based on survey results								Questionnaire	
6507 Eaglecrest Road Ex. Elev's (FFE, HVAC, etc.)		Yes	Yes	Yes		Yes	Yes		N/A 721.42	02-year 719.98	10-year 719.94			02-year	02-year	02-year	Questionnaire	
6513 Eaglecrest Road	Yes	Yes		Yes					25-year 712.87	02-year 710.59	02-year 710.05		N/A	02-year		02-year	Questionnaire	
5630 Amity Place								Yes	See above	See above			See above				Questionnaire	
5644 Amity Place								Yes								02-year	6367	
5630 Amity Place					Yes	Yes		Yes						10-year	10-year	02-year	890233	
5638 Amity Place					Yes			Yes						10-year		02-year	Questionnaire	
5644 Amity Place Ex. Elev's (FFE, HVAC, etc.)				Yes		Yes						50-year 706.03		10-year			Questionnaire	
5720 Amity Place Ex. Elev's (FFE, HVAC, etc.)				Yes		Yes						10-year 704.00		10-year			Questionnaire	
5808 Amity Place Ex. Elev's (FFE, HVAC, etc.)				Yes	Yes	Yes		Yes				02-year 701.91	10-year	02-year		02-year	Questionnaire	
5832 Amity Place					Yes	Yes		Yes					10-year	10-year		02-year	Questionnaire	
5900 Amity Place					Yes	Yes		Yes					10-year	10-year		02-year	Questionnaire	
5908 Amity Place	Yes	Yes						Yes	No flooding issues predicted by model								Questionnaire	
5930 Amity Place									No flooding/erosion issues reported								Questionnaire	
5944 Amity Place									No flooding/erosion issues reported								Questionnaire	
6023 Amity Place					Yes	Yes		Yes						02-year	02-year		10-year	Questionnaire
6101 Amity Place Ex. Elev's (FFE, HVAC, etc.)	Yes				Yes	Yes			02-year 692.13					02-year	02-year		Questionnaire	

Existing Conditions Floodplain Map

- Illustrates Predicted Extent of
- 100-Year Storm Event
 - 1 percent chance of storm occurring in any given year
- 2-Year Storm Event
 - 50 percent chance of storm occurring in any given year

Existing Conditions Floodplain Map – 100 Year Event



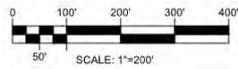
Amity Place Channel Data

River Station	W.S. Elevation	River Station	W.S. Elevation
20085	732.39	18433	703.52
20044	731.53	18382	702.41
19999	729.60	18251	701.62
19957	727.76	18242	701.97
19910	722.68	18185	701.03
19900	722.04	18164	700.63
19855	721.34	18156	700.13
19798	719.77	18104	699.69
19741	717.96	18068	699.37
19695	717.08	18017	699.66
19665	717.19	17911	699.58
19630	716.41	17886	697.86
19612	715.25	17796	697.19
19561	713.44	17776	697.29
19508	712.91	17755	697.44
19475	712.38	17708	697.23
19432	710.98	17676	696.53
19388	710.74	17612	695.87
19379	710.72	17547	696.23
19301	710.74	17531	695.69
19265	710.74	17466	695.92
19235	710.46	17377	695.57
19199	709.94	17357	694.48
19168	710.05	17317	694.28
19149	709.71	17264	694.53
19099	708.70	17247	694.54
19049	707.84	17231	694.66
18999	708.12	17169	694.72
18979	707.04	17152	694.73
18940	706.62	17117	694.71
18896	706.25	17082	694.70
18825	706.21	17019	694.38
18800	706.36	16974	694.33
18774	706.04	16984	690.56
18737	706.07	16829	690.12
18687	705.64	16779	688.94
18655	705.52	16729	687.94
18627	705.43	16679	687.31
18586	703.63	16659	687.53
18557	703.72	16629	686.98
18507	703.75	16575	686.58
18457	703.74		

Shed Index

Approx Base Elev	Approx Base Elev
01	729.29 25 700.58
02	727.26 26 699.50
03	725.22 27 706.55
04	724.70 28 706.27
05	722.22 29 699.50
06	713.97 30 696.81
07	714.82 31 695.50
08	712.80 32 697.32
09	709.60 33 695.64
10	709.89 34 699.49
11	709.20 35 697.99
12	710.38 36 694.85
13	707.05 37 705.89
14	707.57 38 694.60
15	710.45 39 695.04
16	704.79 40 701.53
17	703.40 41 696.48
18	701.45 42 694.31
19	700.58 43 693.33
20	705.20 44 697.23
21	705.13 45 693.78
22	699.91 46 691.45
23	699.30 47 689.89
24	704.11 48 691.92

STV/Ralph Whitehead Associates, Inc.
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LEGEND

APPROXIMATE FLOOD BOUNDARY	
STORM DRAINAGE	
HEC RAS CROSS SECTION	
RIVER STATION	
EXISTING CONTOURS	
CHANNEL FLOW PATH	

REVISED 11/21/2012
 CHARLOTTE, NORTH CAROLINA
**CEDAR EAST
 EXISTING CONDITIONS
 100-YEAR FLOOD PLAIN MAP**
 SCALE: H: 1"=200'

Existing Conditions Floodplain Map – 2 Year Event



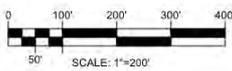
Amity Place Channel Data

River Station	W.S. Elevation	River Station	W.S. Elevation
220085	783136	18433	7701527
220044	7830583	18382	7694833
199999	7289627	18231	7693625
199937	727746	18242	7693942
199910	7221624	18185	7691032
199900	7223381	18184	7691657
198555	721938	18156	7691134
197788	718778	18104	6996263
19741	7179364	18088	6996374
198585	7176185	18017	6996368
198655	7175191	17911	6995571
188300	7165419	17886	6995815
188122	7164220	17796	6994186
198531	7152485	17776	6994281
198588	7121945	17755	6994475
184735	7133325	17708	6994227
184332	7100943	17676	6993584
193388	7101784	17612	6993354
193319	7101788	17587	6993281
193301	7101784	17531	6993348
192265	7101783	17466	6993247
192235	7101472	17377	6993379
193189	7101785	17337	6993481
193188	7101781	17317	6993282
193149	7101770	17284	6993331
193099	7101785	17247	6993341
193049	7101783	17211	6993383
193099	7101781	17169	6993723
192979	7101489	17152	6993734
18940	7101483	17117	6993734
18898	7101482	17082	6993783
188265	7101385	17019	6993327
188000	7101382	16974	6993324
18774	7101385	16884	6993329
187337	7101389	16829	6997198
186877	7101384	16779	6998275
186525	7101326	16729	6997990
186277	7101317	16679	6997531
185886	7101347	16659	6997533
185537	7101178	16629	6994985
185617	7101146	16575	6993584
184427	7101138		

Shed Index

	Approx. Base Elev.	Approx. Base Elev.
01	729.29	25 700.59
02	727.26	26 699.50
03	725.22	27 706.55
04	724.70	28 706.27
05	722.22	29 699.50
06	713.97	30 696.81
07	714.82	31 695.50
08	712.80	32 697.32
09	709.60	33 695.64
10	709.89	34 699.49
11	709.20	35 697.99
12	710.38	36 694.85
13	707.05	37 705.89
14	707.57	38 694.60
15	710.45	39 695.04
16	704.79	40 701.53
17	703.40	41 696.48
18	701.45	42 694.31
19	700.58	43 693.33
20	705.20	44 697.23
21	705.13	45 693.78
22	699.91	46 691.45
23	699.30	47 689.89
24	704.11	48 691.92

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LEGEND

- APPROXIMATE FLOOD BOUNDARY
- STORM DRAINAGE
- HEC RAS CROSS SECTION RIVER STATION
- EXISTING CONTOURS
- CHANNEL FLOW PATH

REVISED 11/21/2012
 CHARLOTTE, NORTH CAROLINA
**CEDAR EAST
 EXISTING CONDITIONS
 100 YEAR FLOODPLAIN MAP**
 SCALE: H: 1"=200'

EVALUATING ALTERNATIVES

Coming up with the “BEST” solutions



1. Public Safety

2. Private Property
Impact

3. Public Cost

EVALUATING ALTERNATIVES

Types of Alternatives Considered

- **Replacement of failing pipes**
- **Different culvert and pipe sizes**
- **Different culvert/pipe shapes and materials**
- **Environmental considerations**
- **Additional pipes and inlets**
- **New alignments**
- **Detaining water to reduce flow**
- **Stream stabilization**
- **Changing stream profiles**

PUBLIC SAFETY

IMPACTS



COST

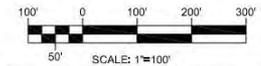
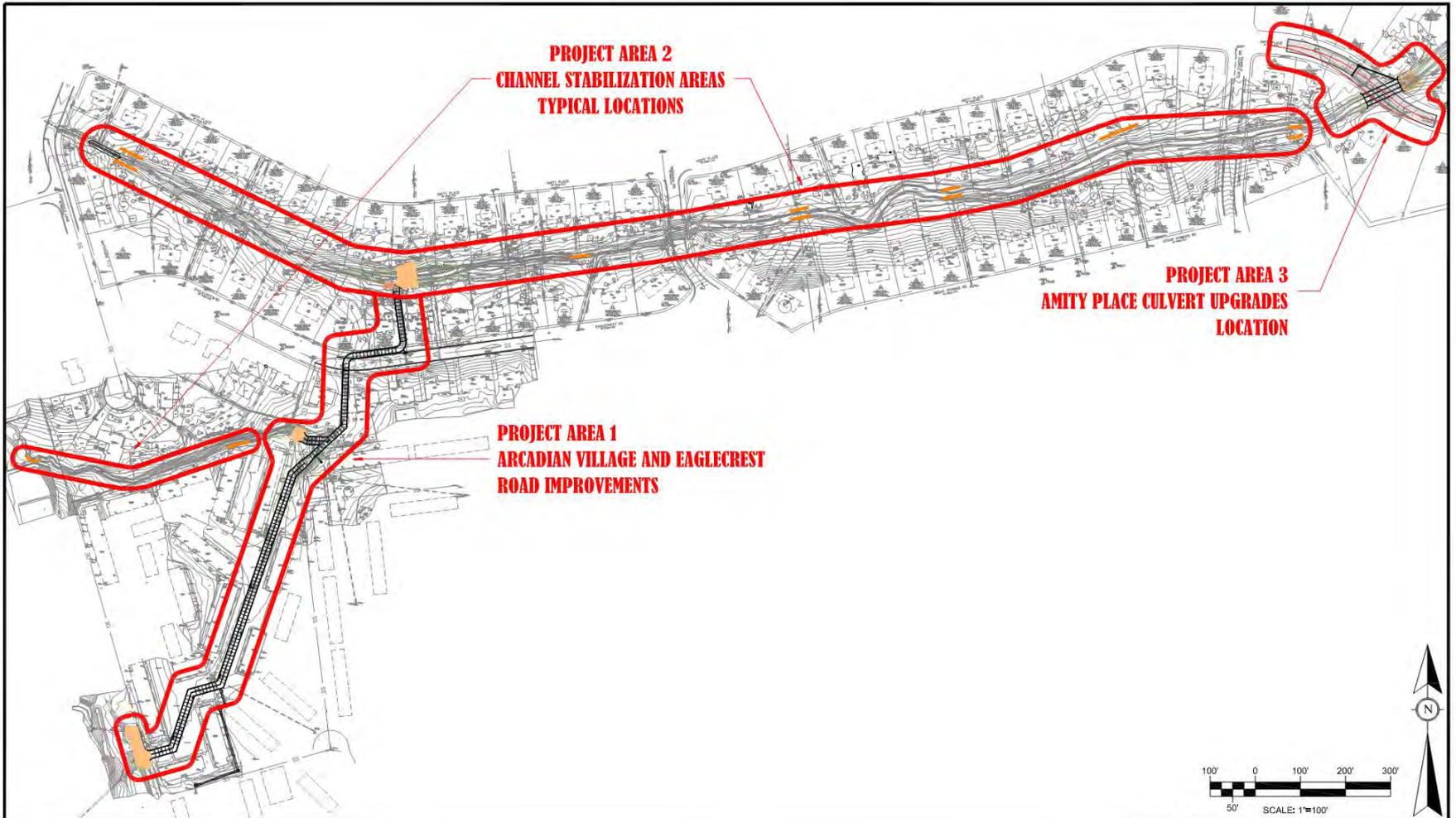
PROJECT CONSTRAINTS

Technically Feasible

Constructible

Accepted by Federal and State Agencies

Project Areas



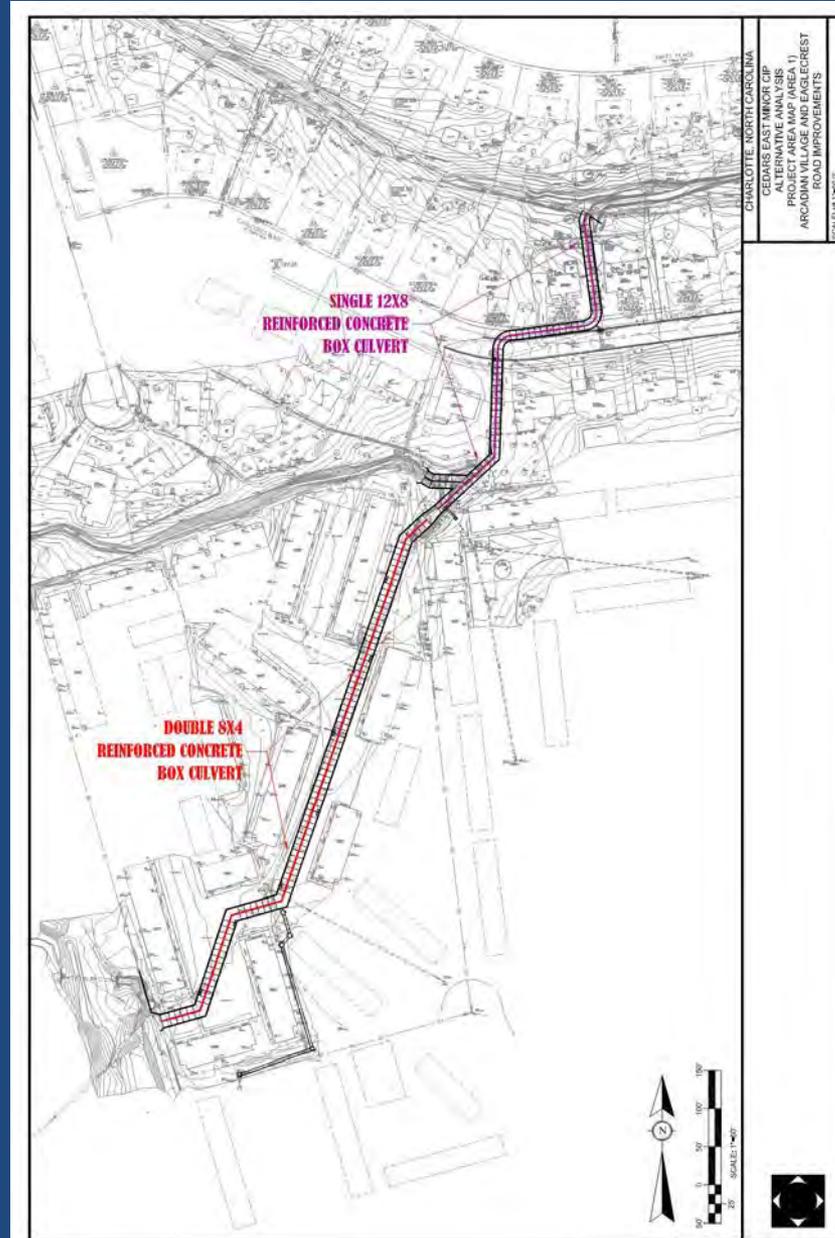
SCALE: 1"=100'

CHARLOTTE, NORTH CAROLINA

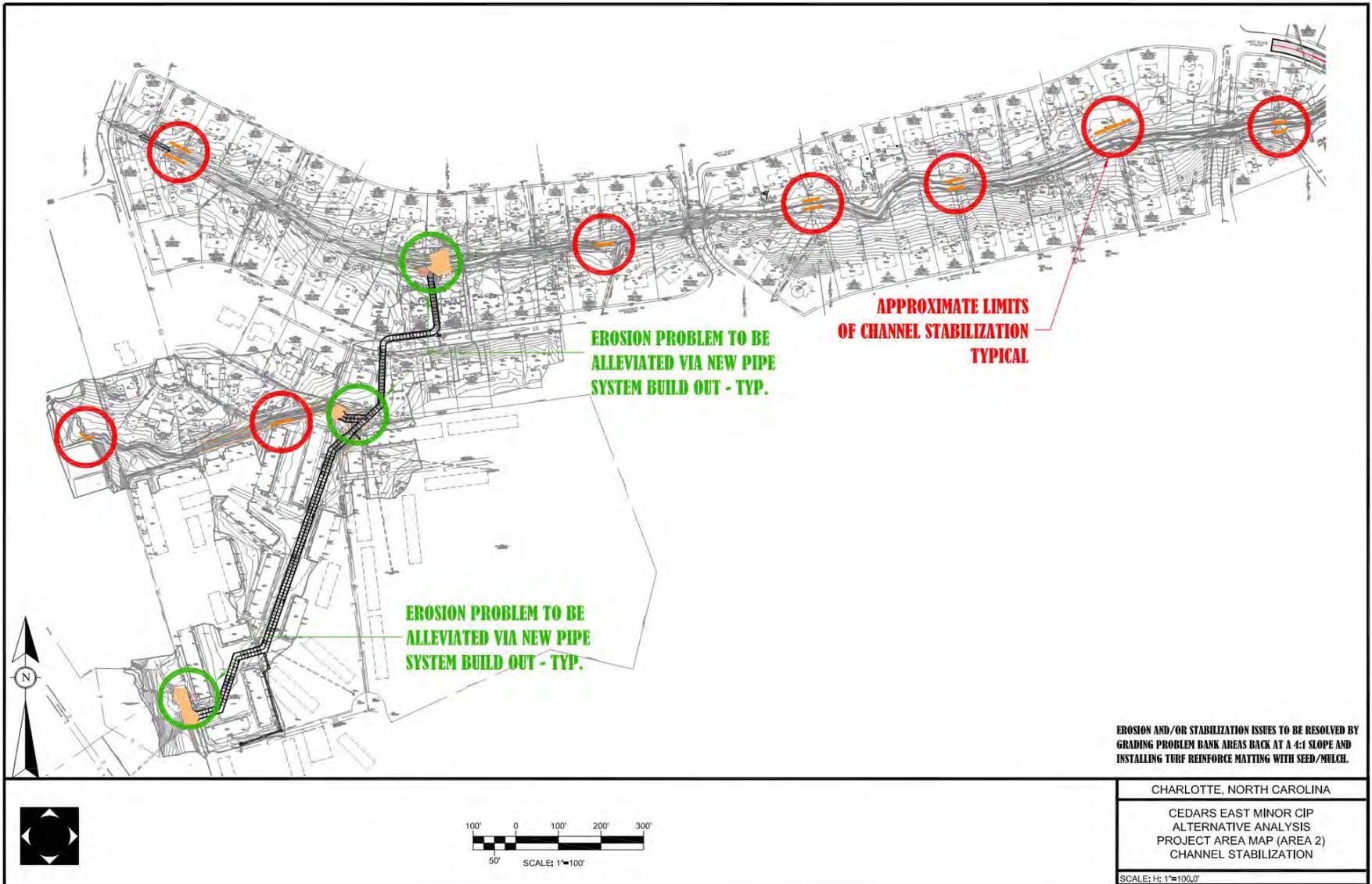
CEDARS EAST MINOR CIP
ALTERNATIVE ANALYSIS
PROJECT AREA MAP
SHEET INDEX

SCALE: H: 1"=100.0'

Arcadian Village and Eaglecrest Road Improvements



Channel Stabilization Areas



Stabilization Area Site Examples



Appendix M - Sufficiency Analysis, Erosion and/or Stabilization Issues Photographic Reference

Erosion Reference No. 5

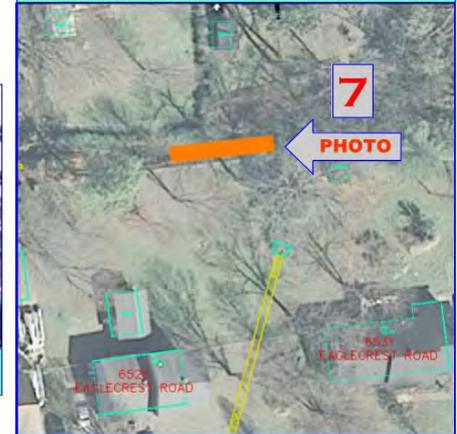


Photograph No. 5 - Erosion on both banks, near center of picture. (Near 5506 Amity Place)

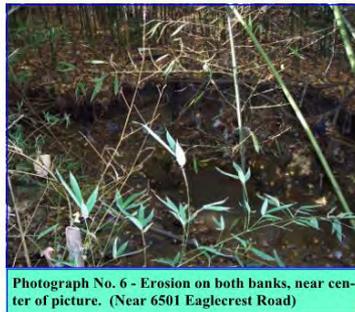


Photograph No. 7 - Erosion on south bank, near center of picture. (Near 6525 Amity Place)

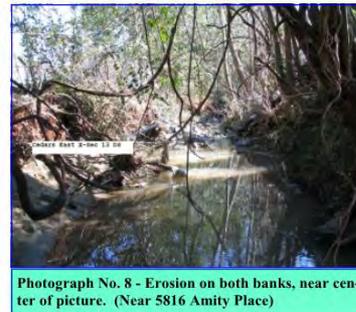
Erosion Reference No. 7



Erosion Reference No. 6



Photograph No. 6 - Erosion on both banks, near center of picture. (Near 6501 Eaglecrest Road)



Photograph No. 8 - Erosion on both banks, near center of picture. (Near 5816 Amity Place)

Erosion Reference No. 8



Bank Stabilization Shift in Design Philosophy



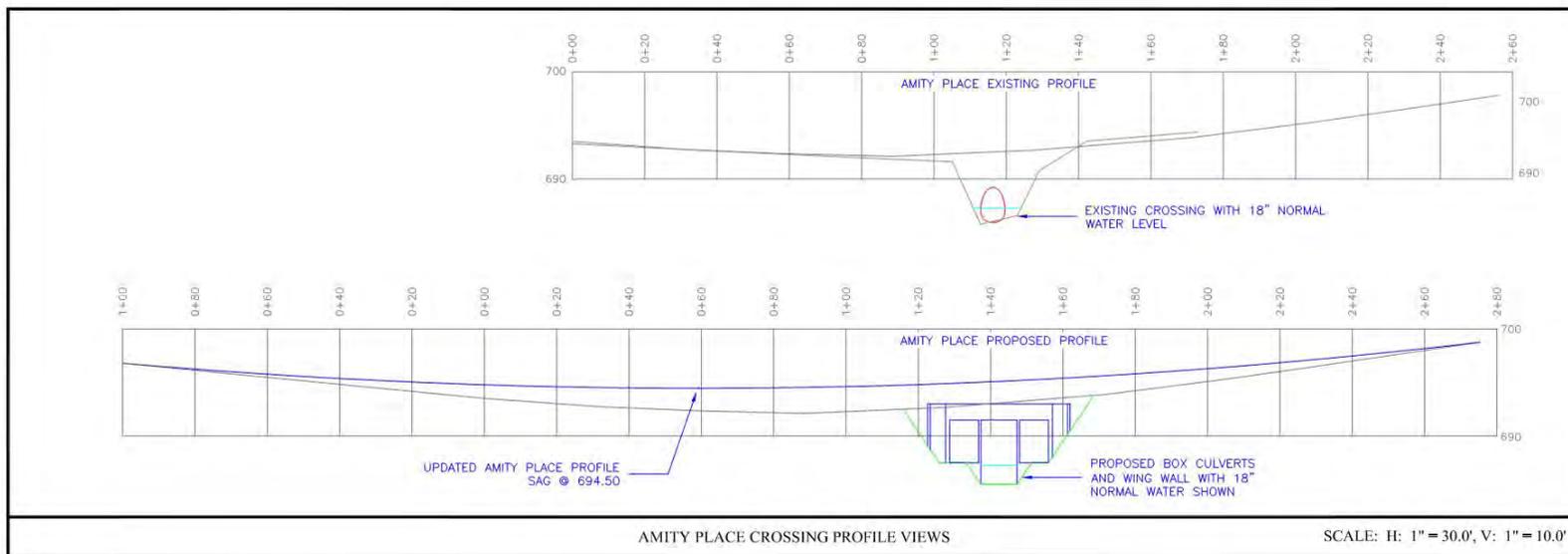
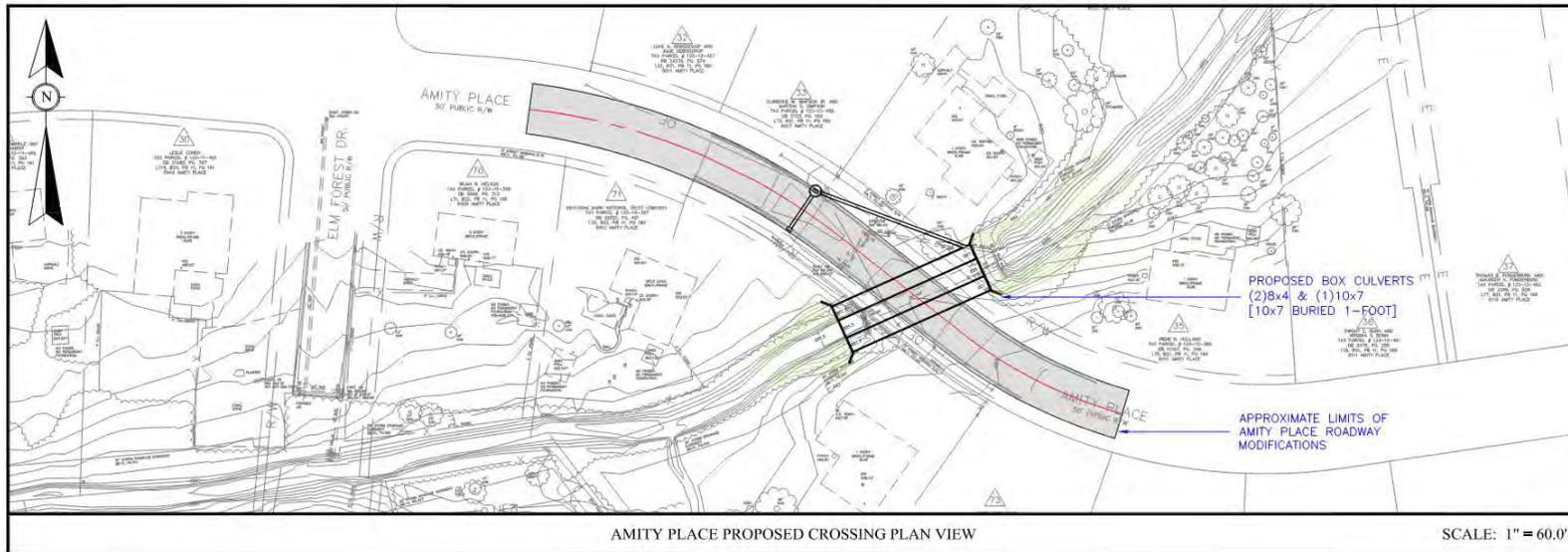
Until mid-1990's SWS' work characterized by:

Full rip rap, removal of vegetation

Since mid-1990's SWS' work characterized by:

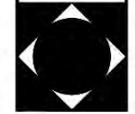
Rip rap minimization, preservation/replacement of vegetation

Amity Place Culvert Upgrades

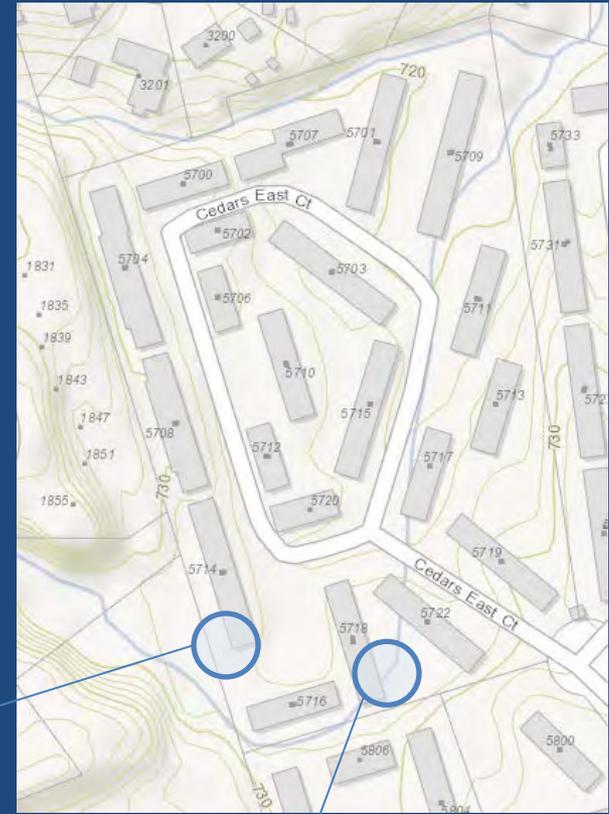
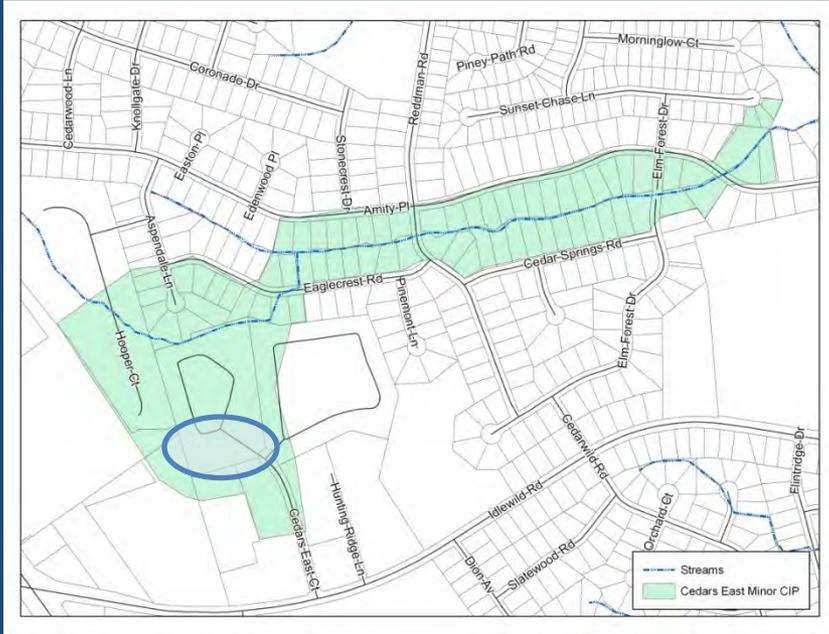


CHARLOTTE, NORTH CAROLINA
 CEDARS EAST MINOR CIP
 ALTERNATIVE ANALYSIS
 SCALE: VARIES
 SHEET 1 OF 1

CEDARS EAST MINOR CIP
 ALTERNATIVE ANALYSIS
 PROJECT AREA MAP (AREA 3)
 AMITY PLACE CULVERT CROSSING



Interim Maintenance Work



Proposed Alternate Floodplain Map

- Illustrates Predicted Extent of
- 100-Year Storm Event
 - 1 percent chance of storm occurring in any given year

Proposed Alternate Floodplain Map

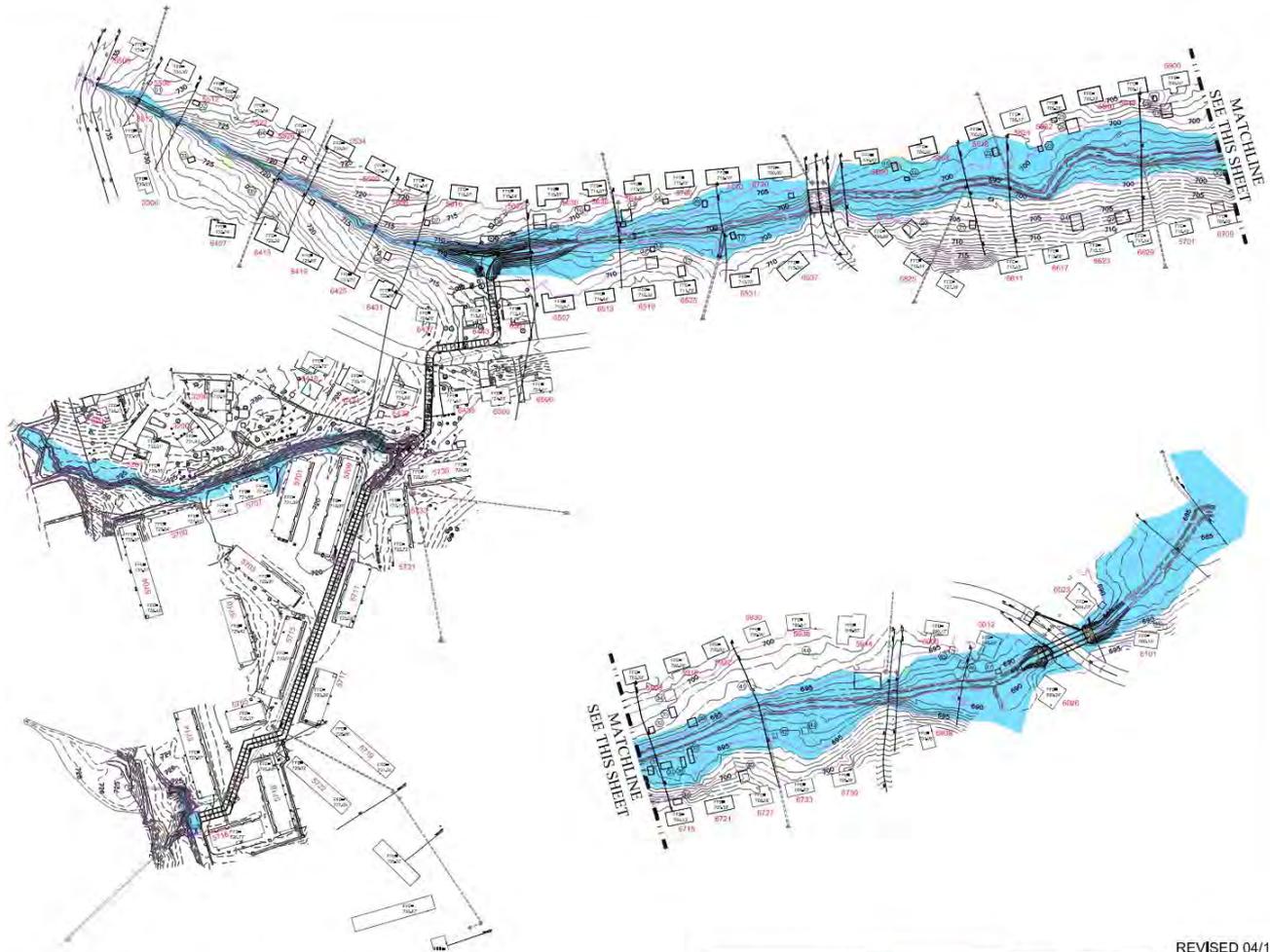


Amity Place Channel Data

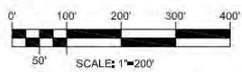
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19235	709.71	17357	694.87
19199	709.56	17317	693.85
19168	709.54	17264	694.22
19149	709.47	17247	694.22
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18898	706.39	17019	694.02
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18774	706.31	16829	688.74
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18457	703.88		
18433	703.66		

Shed Index

Approx Base Elev
01 729.29
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03 725.22
04 724.70
05 722.22
06 713.97
07 714.82
08 712.80
09 709.60
10 709.89
11 709.20
12 710.38
13 707.05
14 707.57
15 710.45
16 704.79
17 703.40
18 701.45
19 700.58
20 705.20
21 705.13
22 699.91
23 699.30
24 704.11
25 700.58
26 699.50
27 706.55
28 706.27
29 699.50
30 696.81
31 695.50
32 697.32
33 695.64
34 699.49
35 697.99
36 694.85
37 705.89
38 694.60
39 695.04
40 701.53
41 696.48
42 694.31
43 693.33
44 697.23
45 693.78
46 691.45
47 689.89
48 691.92



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REVISED 04/10/2013	
CHARLOTTE, NORTH CAROLINA	
CEDAR EAST ALTERNATIVE ANALYSIS 100-YEAR FLOOD PLAIN MAP	
SCALE: H: 1"=200'	

LEGEND	
APPROXIMATE FLOOD BOUNDARY	(Light blue shaded area)
STORM DRAINAGE	(Dashed line)
REGULAR CURVE SECTION	(Dashed line with 'R' and 'C' markers)
RIVER STATION	(Numbered line)
CHANNEL COORDINATE	(Numbered line)
CHANNEL FLOW PATH	(Blue line with arrows)
STRUCTURE ADDRESS	(Red number)

Path Forward

- Additional information obtained during this meeting will be considered and incorporated into the proposed alternatives, where applicable.
- The alternative will be finalized
- Design phase will begin
- Another public meeting will be held once the City has produced plans that are approximately 70% complete

Design Phase

- Preliminary Design
- 401/404 Permitting
- Easement Acquisition
- Final Design



Design Phase

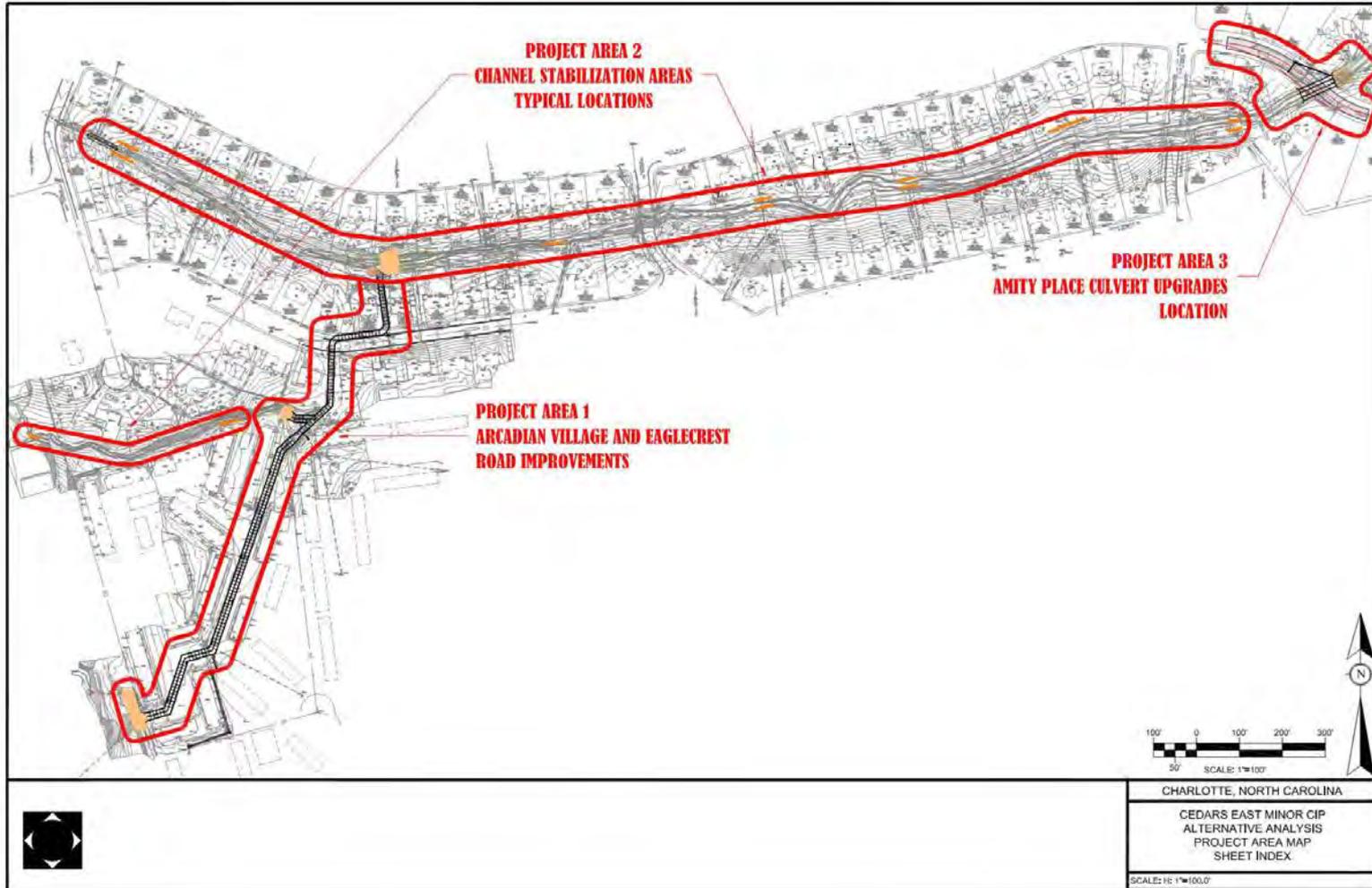
- Preliminary Design
 - Drainage system layout & location
 - Additional field survey if needed
 - Utility coordination & design
 - Geotechnical investigations
 - Traffic control plans
 - Erosion control plans
 - Permits
 - Easement acquisition
 - Public meeting



General Questions?

- Please remember to sign-in and fill out a customer service card
- The City and our consultant will stay here to answer any specific questions you may have. Please hold questions about your specific property until the breakout sessions.
- If we are unable to answer your question tonight, please make sure we have your contact information so we can get back to you.
- You can email any questions to Matthew Anderson (manderson@charlottenc.gov)

Breakout Sessions



**Thank you coming to the meeting
and being involved!**