

Costs of Extreme Weather



Case Study:
NC 12
and
BONNER BRIDGE



Agenda

- Basic info on NC 12
- NC 12's severe weather history
- How are costs collected
- Map of work history on NC 12





- NC 12 extends approximately 200 miles along the Outer Banks
- 7 million visitors each year
- Bulk of traffic is seasonal
- Extremely vulnerable to weather

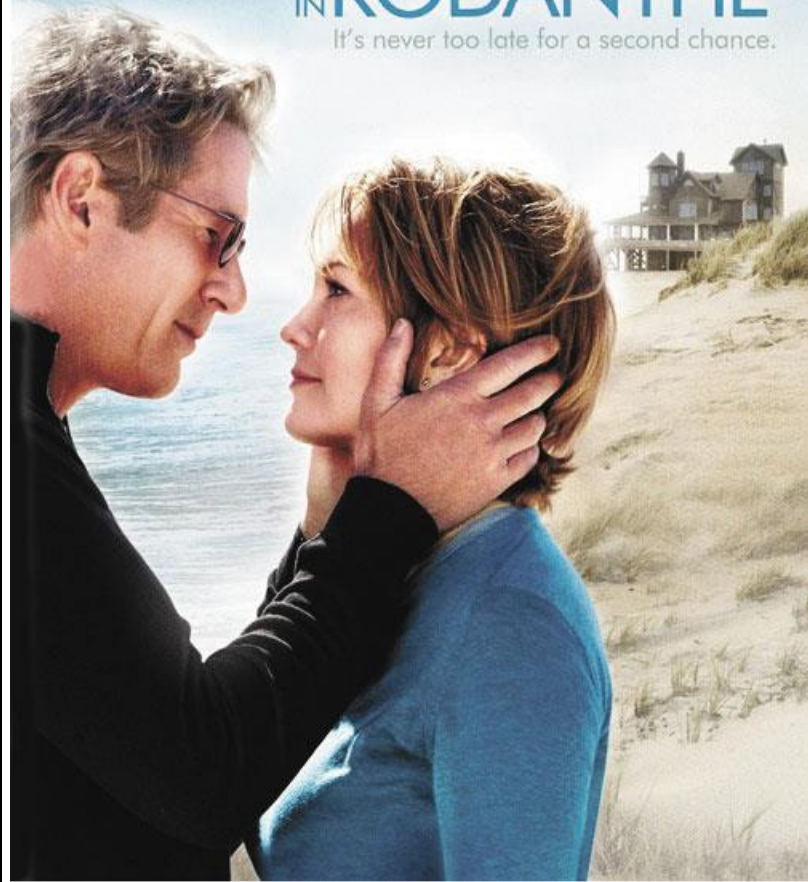
Outer Banks Attractions



BASED ON THE BEST-SELLING NOVEL FROM THE AUTHOR OF THE NOTEBOOK
RICHARD GERE DIANE LANE

NIGHTS IN RODANTHE

It's never too late for a second chance.













Dredging Contracts

Over \$50 million since 2001

Storm	Cost
January 1998 Flood	\$158,000
Hurricane Dennis	\$1.6 million
Tropical Storm Gustav	\$92,000
Hurricane Isabel	\$8.8 million
Hurricane Alex	\$100,000
Hurricane Ophelia	\$402,000
2006 Nor'easter	\$2.9 million
Tropical Storm Ida	\$1.3 million
Hurricane Earl	\$75,000
Hurricane Irene	\$16 million
Hurricane Sandy	\$5 million
TOTAL:	\$36.5 million

Sections Inventory

18 pages (546 rows)

* Sections	Lane Direction	Lane	From MP	To MP	* Sections Class Code	* Sections Status	Maint. History	Comments	Att.	User Update	Date Update	Date of Birth	Date
028 US64 0.00-28.86 R	All	All	0	28.858	Primary Paved	Section Dead	Yes			Interface	2/17/2012	7/1/2008	2/17
028 US64 0.00-14.73 *	All	All	0	14.73	Primary Paved	Section Active	Yes			Interface	9/28/2012	2/17/2012	
028 US64 14.73-25.11 *	All	All	14.73	25.121	Primary Paved	Section Dead	No			Interface	4/17/2012	2/17/2012	4/17
028 US64 25.11-28.66 *	All	All	25.121	28.668	Primary Paved	Section Dead	No			Interface	4/17/2012	2/17/2012	4/17
028 US64 0.00-28.66 *												4/17/2012	9/28
028 US64 14.73-25.12 *												9/28/2012	
028 US64 25.12-28.67 *												9/28/2012	
028 US158 0.00-17.97 R												7/1/2008	2/17
028 US158 0.00-1.65 R												2/17/2012	
028 US158 1.65-2.84 *												2/17/2012	
028 US158 2.84-3.24 R												2/17/2012	3/8/0
028 US158 3.24-17.97 *												2/17/2012	4/17
028 US158 3.24-18.06 *												4/17/2012	3/8/0
028 US158 3.22-18.06 *												3/8/2013	
028 US158 2.84-3.22 R												3/8/2013	
028 US264 0.00-25.95 *												9/2/2003	2/17
028 US264 0.00-25.97 *												2/17/2012	
028 US158 0.09-18.08 L												8/8/2006	2/17
028 US158 14.82-15.24 L												2/17/2012	3/8/0
028 US158 16.43-18.08 L												2/17/2012	
028 US158 14.84-15.24 L												3/8/2013	
028 US64 0.00-5.85 R												7/1/2008	2/17
028 US64 0.00-0.06 *												2/17/2012	9/28
028 US64 0.06-5.32 R												2/17/2012	9/28
028 US64 5.32-5.85 *												2/17/2012	9/28
028 US64 0.00-0.11 *												9/28/2012	
028 US64 0.11-5.37 R												9/28/2012	
028 US64 5.37-5.88 *												9/28/2012	
028 US64BYP 0.00-5.26 L	All	All	0.507	5.236	Primary Paved	Section Dead	Yes			Interface	2/17/2012	8/26/2006	2/17
028 US64 0.53-5.79 L	All	All	0.507	5.766	Primary Paved	Section Dead	No			Interface	9/28/2012	2/17/2012	9/28
028 US64 0.51-5.77 L	All	All	0.507	5.766	Primary Paved	Section Active	No			Interface	9/28/2012	9/28/2012	

Maintenance History

3 pages (59 rows)

Task #	Administrative Uni	Work Function	WBS	Asset Type	Responsible Crew	Start Date	Fin
828685	01 Roadside Env (072)	2904-Turf Management (ACR)	1.102813	Sections		1/3/2012	3/1
828685	01 Roadside Env (072)	2904-Turf Management (ACR)	1.102813	Sections		1/3/2012	3/1
790241	01 /1 Dare Mnt	2912-Brush and Tree Control / Mechanical/ Other (SHM)	1.102811	Sections		7/29/2011	1/9
790241	01 /1 Dare Mnt	2912-Brush and Tree Control / Mechanical/ Other (SHM)	1.102811	Sections		7/29/2011	1/9
789076	01 /1 Dare Mnt	3120-Repair / Maintain Barriers (LFT)	1.102720	Sections		7/26/2011	7/2
789076	01 /1 Dare Mnt	3120-Repair / Maintain Barriers (LFT)	1.102720	Sections		7/26/2011	7/2
787151	01 /1 Dare Mnt	3112-Shoulder Maintenance / Reconstruction (SHM)	1.102811	Sections		7/20/2011	7/2
787151	01 /1 Dare Mnt	3112-Shoulder Maintenance / Reconstruction (SHM)	1.102811	Sections		7/20/2011	7/2
781812	01 /1 Dare Mnt	2816-Asphalt Pavement Repair / Patching (SYD)	1.102811	Sections		7/1/2011	8/3
781812	01 /1 Dare Mnt	2816-Asphalt Pavement Repair / Patching (SYD)	1.102811	Sections		7/1/2011	8/3
771843	01 /1 Dare Mnt	3126-Install Pipes (<=48") (LFT)	1.102811	Sections		6/1/2011	7/6
738417	01 /1 Dare Mnt	3120-Repair / Maintain Barriers (LFT)	1.102820	Sections		2/10/2011	3/1
738417	01 /1 Dare Mnt	3120-Repair / Maintain Barriers (LFT)	1.102820	Sections		2/10/2011	3/1
672966	01 Dist 1 Adm	3120-Repair / Maintain Barriers (LFT)	1.102820	Sections		5/21/2010	1/1
672966	01 Dist 1 Adm	3120-Repair / Maintain Barriers (LFT)	1.102820	Sections		5/21/2010	1/1
671551	01 /1 Dare Mnt	2910-Manual Brush and Tree Control (SHM)	1.102811	Sections		6/7/2010	6/1
671551	01 /1 Dare Mnt	2910-Manual Brush and Tree Control (SHM)	1.102811	Sections		6/7/2010	6/1
671529	01 /1 Dare Mnt	2912-Brush and Tree Control / Mechanical/ Other (SHM)	1.102811	Sections		6/8/2010	11/
671529	01 /1 Dare Mnt	2912-Brush and Tree Control / Mechanical/ Other (SHM)	1.102811	Sections		6/8/2010	11/
645598	01 Dist 1 Adm	3120-Repair / Maintain Barriers (LFT)	1.102820	Sections		3/10/2010	1/1

Quick Links

- Budget Plan
- MMS > Progress > Day C

Location Reference

Basic LRM

Color Schema

Maroon

Design Mode



Maintenance Management System



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	START_DATE	END_DATE	END_MONTH	END_YEAR	OFFSET_FROM	OFFSET_TO	DATE_COMPLETED	TASK_NAME	AMOUNT	LABOR_COST	EQUIPMENT_COST	MATERIAL_COST	OTHER_COST
2	30.03.2006 00:00:00	30.03.2006 08:00:00	March	2006	0	0.1	20.07.2007 00:00:00	228745		\$0.00	\$0.00	\$0.00	\$0.00
3	21.11.2011 00:00:00	21.11.2011 00:00:00	November	2011	0	11.92		821351	40.5	\$906.39	\$971.68	\$0.00	\$0.00
4	25.05.2006 00:00:00	25.05.2006 00:00:00	May	2006	0	11.92	16.10.2007 00:00:00	246214		\$0.00	\$0.00	\$0.00	\$0.00
5	31.10.2006 00:00:00	31.10.2006 08:00:00	October	2006	0	11.92	12.01.2007 00:00:00	301296		\$171.24	\$16.14	\$0.00	\$0.00
6	19.03.2007 00:00:00	20.03.2007 08:00:00	March	2007	1	1.25		344075	56	\$3,990.89	\$2,385.07	\$0.00	\$0.00
7	21.03.2007 00:00:00	21.03.2007 08:00:00	March	2007	1	1.25		344684		\$0.00	\$0.00	\$0.00	\$0.00
8	09.03.2007 00:00:00	09.03.2007 08:00:00	March	2007	0	11.92		340739		\$0.00	\$0.00	\$0.00	\$0.00
9	04.04.2007 00:00:00	05.04.2007 08:00:00	April	2007	5.5	6.5		350412		\$648.74	\$745.28	\$0.00	\$0.00
10	01.05.2007 00:00:00	08.05.2007 00:00:00	May	2007	9.1	11.9	01.06.2007 00:00:00	341530	39424	\$4,302.29	\$4,766.24	\$39,533.51	\$0.00
11	23.04.2007 00:00:00	01.05.2007 00:00:00	May	2007	0	8.8	01.06.2007 00:00:00	341527	123904	\$18,142.69	\$20,824.94	\$0.00	\$0.00
12	03.04.2007 00:00:00	04.04.2007 08:00:00	April	2007	5.5	6.5		349885	95.7	\$2,356.41	\$1,640.48	\$0.00	\$0.00

	N	O	P	Q	R	S	T
1	TOTAL_COST	COMMENT_STR	COUNTY	INV_ELEM_NAME	NC_DIVISION_ID	OWNER_NAME	ACTIVITY_NAME
2	\$0.00	ret. l l skip lines e.l. c.l. at cedar island ferry dock .	16	016 NC12 0.00-11.92 *	2	02 Traffic Serv	4101-LONGLINES PAINTED
3	\$1,878.07	downeast primary	16	016 NC12 0.00-11.92 *	2	02 /2 Carteret Maint	3102-Removal of Hazards/Debris From ROW
4	\$0.00	Cedar Island Ferry	16	016 NC12 0.00-11.92 *	2	02 Roadside Env	4331-PLANTING & PLANT MAINT
5	\$187.38	Sweep bridges 16 and 12 on NC12	16	016 NC12 0.00-11.92 *	2	02 Bri New Bern	4531-REMOV DECK DEBRIS
6	\$6,375.96	full depth patch 2 miles west of ferry	16	016 NC12 0.00-11.92 *	2	02 /2 Carteret Maint	3715-FULL DEPTH PATCH HOT MIX
7	\$0.00	full depth patch 2 miles west of ferry	16	016 NC12 0.00-11.92 *	2	02 /2 Carteret Maint	3715-FULL DEPTH PATCH HOT MIX
8	\$0.00	full depth patch 2 miles west of ferry	16	016 NC12 0.00-11.92 *	2	02 /2 Carteret Maint	3715-FULL DEPTH PATCH HOT MIX
9	\$1,394.02	comp,ete approach on ei side , south side rd	16	016 NC12 0.00-11.92 *	2	02 /2 Carteret Maint	3715-FULL DEPTH PATCH HOT MIX
10	\$48,602.04	Carteret	16	016 NC12 0.00-11.92 *	2	02 Bitum Ops	3664-SPLIT SEAL W/LT WT AGG
11	\$38,967.63	Carteret	16	016 NC12 0.00-11.92 *	2	02 Bitum Ops	3664-SPLIT SEAL W/LT WT AGG
12	\$3,996.89	comp,ete approach on ei side , south side rd	16	016 NC12 0.00-11.92 *	2	02 /2 Carteret Maint	3715-FULL DEPTH PATCH HOT MIX

ZCNS41 ALV GRID

Project Actual Cost Project Commitment



Division	County	County Name	Identification	Description	Actual costs	Commitment	St
01	028	DARE	13201.1028005	Dare - CoWide Snow Remov			CF ▲
01	028	DARE	13201.1028006	Dare - Reserved Special			CF ▼
01	028	DARE	13201.1028007	Dare - Reserved Special			CF
01	028	DARE	13201.1028008	Dare - Reserved Special			CF
01	028	DARE	13201.1028009	Dare - Reserved Special			CF
01	028	DARE	13201.1028010	Dare -Canal Area	22,602.59		RE
01	028	DARE	13201.1028011	Dare - New Inlet	10,647,940.36	47,791.65	RE
01	028	DARE	13201.1028012	Dare -Rodanthe-SCurves	3,378,595.67		RE
01	028	DARE	13201.1028013	Dare -Hatteras	22,638.66		RE
01	028	DARE	13201.1028014	Dare -US 264 Pipe/Slope/Guardrail Fail	70,569.31		RE
01	028	DARE	13201.1028015	Dare -NC 12-Duck	8,869.03		RE
01	028	DARE	13201.1028016	Dare-Whalebone Message Board	37,683.87		RE
01	028	DARE	13201.1028017	Dare - NC 12 Signal Cabinet	6,249.04		RE
01	028	DARE	13201.1028018	Dare -Buxton Pipe Replacement	128,725.59		RE
01	028	DARE	13201.1028019	Dare -Signal -NC 12@Waterside Park			RE
01	028	DARE	13201.1028020	Dare -Signal -NC 12 & SR 1224(Avon)			RE
01	028	DARE	13201.1028021	Dare -Signal -NC 12 & SR 1424(Avon)			RE
01	028	DARE	13201.1028022	Dare -Signal -NC 12 @Ferry Entrance @ H			RE
01	028	DARE	13201.1028023	Dare -Signal -NC 12 @Ferry Exit @ H			RE
01	028	DARE	13201.1028024	Dare -US 264-Repair Collins Creek Board	118,517.10		RE
01	028	DARE	13201.1028025	NC 12 Perm.Bridge - Rodanthe & Pea Isle	913,493.25	53,053.91	RE
01	028	DARE	13201.1028026	NC 12 -Ditch Cleanout-Rodanthe			RE
01	037	GATES	13201.103700	Gates County Primary			PR
01	037	GATES	13201.1037001	Gates - CoWide Debri Remov	49,038.33		RE
01	037	GATES	13201.1037003	Gates - CoWide Sign/Signal	359.80		RE
01	037	GATES	13201.1037004	Gates - CoWide Stablize			RE
01	037	GATES	13201.1037005	Gates - CoWide Snow Remov			CF ▲
01	037	GATES	13201.1037006	Gates - Reserved Special			CF ▼

ZTE1 - Create FR-1101 Document

Copy

Header Data

Document No. Keydate Cost Center Pay Period Dt Fr To

Job Details

Job	Workdate	Receiver WBS...	Rec. order	Network	Ac...	SOP.	Fu...	Work A...	Unit	Task Number	Bridge	Route	Signal N...	M...	T...
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															

Employee

Employee No.	Employee Name	SP	SU	Total	J1 A/A	J1 Hrs	J2 A/A	J2 Hrs	J3 A/A	J3 Hrs	J4

Equipment

Inventory No.	Equipment No.	Equipment Description	Total	J1 Hours	J2 Hours	J3 Hours

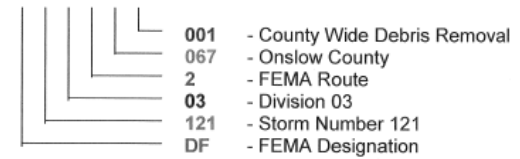
Disaster Related WBS Elements

Disaster WBS Configuration:

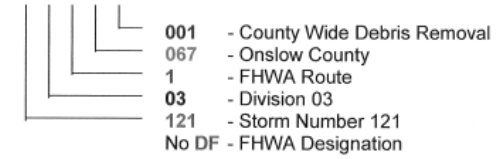
DFnnndd.rcccsss

- DF FEMA designation
- nnn Disaster number
- dd Division
- r Route designation
- ccc County
- sss Site number

FEMA Example: DF12103.2067001

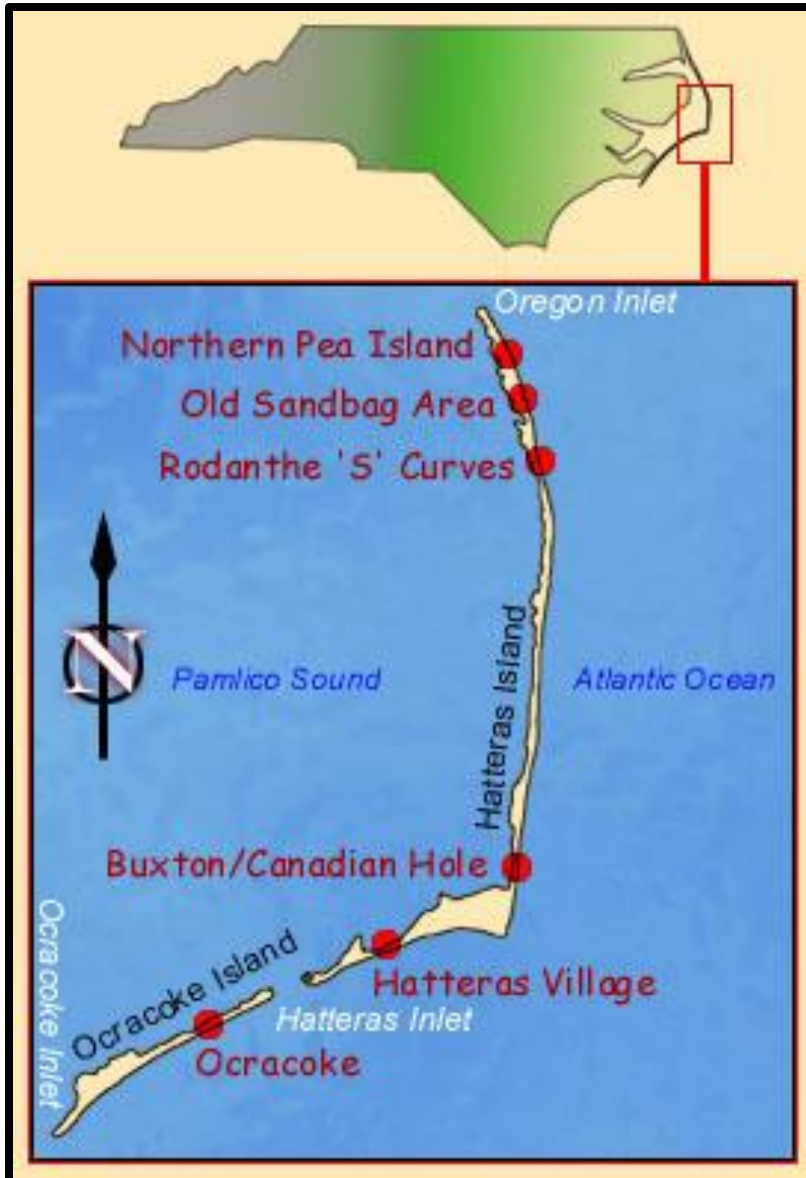


FHWA Example: 12103.1067001



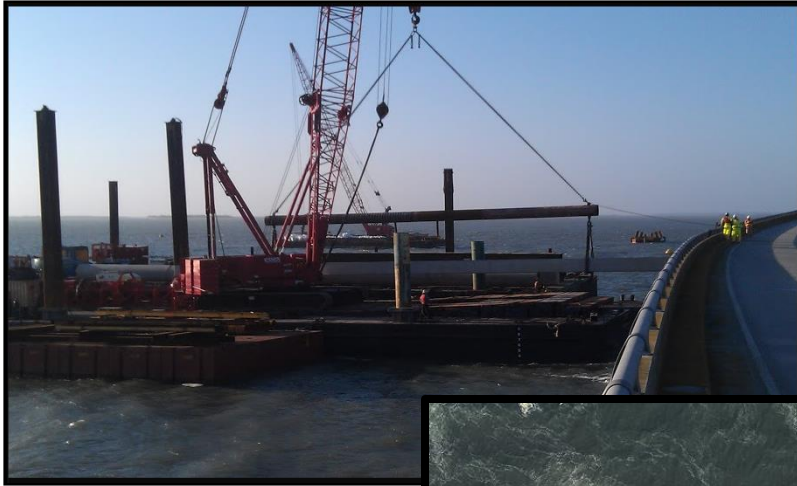
Standard Statewide WBS Elements:

- 001 Debris
- 002 Emergency Protective Measures
- 003 Countywide Signs and Signals
- 004 Countywide Stabilization
- 005 Snow Removal
- 006 Vessel Relocation (Ferry Division Only)
- 007 Equipment Relocation (Ferry Division Only)
- 008 Dredging Operations (Ferry Division Only)
- 009 Reserved
- 010 - 799 1st Site Specific
- 800 and above Reserved for Bridge Department Projects



Hot Spots

- High erosion rates
- Little to no vegetation on dunes
- Highway is in close proximity to ocean
- During storms, sand and water accumulate on the roadway



Phase I



Phase IIb



Phase IIa



QUESTIONS?



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North Carolina Department of Transportation

Disaster Recovery Engineer

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