

Hydraulics Unit Pre-Design Report (Pre-Scoping) for Structure #: 130262

Date: 10/14/2016

County: **Caldwell** Stream: Old Mill Pond/ Gun Powder Creek
Road #: SR 1107 Road Name: Falls Ave.
Division: 11 Location: 0.7 M W JCT SR 1754
Latitude: 38.80484 Longitude: -81.41280 Decimal degrees, a min of 5 decimal points

Assigned to: _____
Prepared By: wsh/REL
Hydro Mgr: PFF Hydro Reviewer: MTS
Project Type: _____

Existing Structure

Structure Type: RC Deck/I Beams Yr Built: 1949
Span Arrangement: 2 @ 40'3", 6@40', 3 @ 20' OAL (ft): 401.0 Skew: _____ Abutment Type: _____
Number of Barrels: _____ @ Span (ft): _____ x Rise (ft): _____
Bed to Crown (ft): 28.0 Clear Roadway (ft): _____ Water Depth (ft) 15.0 Superstructure Depth: _____
ADT: 5300 Year ADT: 2013 Scour Code (item113): _____ Prior Survey Completed: ☒ Survey Date: 07/07/1948
Drainage Area: 34.5 Sq. Mi. Drainage Area Source: USGS Stream Stats Roadway Overtops at Q100: ☐
Discharge Method: USGS Regression Equations USGS Region: 1- Piedmont Stream Gage Number(if applicable): _____
Q10 (cfs): _____ Q25 (cfs): 4,600 Q50 (cfs): 5,800 Q100 (cfs): 6,700 QBFE (cfs): _____
☐ Structure in Flood Hazard Zone Panel #: 2785 Panel Date: 07/07/2009 Type of FIS: DETAILED Date of FIS: _____

Enviromental

Quad Map: GRANITE FALLS, NC River Basin: Catawba Buffer Rule: _____

Primary Stream Classification				Other Stream Classification	
☐ Class B	☐ Class C	☐ SA	☐ SB	☐ Anadromous Fish	☐ Area of Environmental Concern
☐ SC	☐ SWL	☐ WL	☐ WS I	☐ CAMA County	☐ Federal Wild & Scenic Rivers
☐ WS II	☐ WS III	☒ WS IV	☐ WS V	☐ HSB Required	☐ NC Natural & Scenic Rivers
Supplemental Stream Classification				☐ Impaired [303d]	☐ Primary Nursery Area
☐ FWS	☐ HQW	☐ NSW	☐ ORW	☐ TVA	☐ Designated Shellfish Harvesting Area
☐ Sw	☐ Tr	☐ UWL	☐ w/in 0.5mi. of CA	☐ Designated Public Mountain Trout Waters	

Up/Down Stream Features

Upstream Feature: Bridge
Location: 0.6 M S JCT 1802
Structure #: 130086 Route: SR 1002
Latitude: 35.82028 Longitude: -81.42380
Prior Survey Completed: ☐ Survey Date: _____ Bed to Crown (ft): 24.0 Year Built: 1974
Structure Type: Steel Deck/I Beams
Span Arrangement: _____ OAL (ft): _____
Number of Barrels: _____ @ Span (ft): _____ x Rise (ft): _____

Downstream Feature: Lg. DAM
Location: 0.4 M D/S Along Flow Line
Structure #: _____ Route: _____
Latitude: 35.80415 Longitude: -81.42718
Prior Survey Completed: ☐ Survey Date: _____ Bed to Crown (ft) _____ Year Built: _____
Structure Type: _____
Span Arrangement: _____ OAL (ft): _____
Number of Barrels: _____ @ Span (ft): _____ x Rise (ft): _____

Preliminary Structure Estimate [Office Estimate]

Structure Type: _____ Skew: _____
Dimensions/Spans: _____

Notes

Stream Assigned #: 03-08-32

PREDESIGN-PRESURVEY REPORT

Project# _____
TIP# _____
Let Date _____
WBS# _____

B27

County CALDWELL (DIV. 11)

Bridge# 130262
Road# FALLS AVE. SR 1107
Stream GUN POWDER CREEK
(OLD MILL POND)

Type Of Request: POC Force Account TIP NCMA

Date 10/14/16 Name WSH

Assigned To PFF/MTS

Checked By PSC 10-15-16

Prior Survey Date YES 7/7/48 (attach copy of prior survey)

BRN. BK. NONE CO FILE 1948
PDR NONE

Study By Scour Section YES ATTACHED

Flood Zone AE Detail Study DETAILED Date 7/7/09 Panel# 2785 ☐

B.M. Info N/A

Quad Map GRANITE FALLS Drainage Area 34.5 SQ MI From STREAM STATS

Q25 4600 cfs Q50 5800 cfs Q100 6700 cfs Method NEW REG. EQU.

LAT: 35.804839

REGION 1

LONG: -81.412797

EXISTING BRIDGE INFORMATION

Location 0.7 M W. JCT. SR 1754 BUILT: 1949

Average Daily Traffic 5300 (2013) 7% TRK

Length 401' Bed- To Crown 28' Water Depth 15'

Type Structure RC DECK ON I BEAMS

Type Spans 2e 40' 3" 6e 40' 3e 20'

Upstream Structure BRC #86 (130086)

Location DUDLEY SHOALS RD / SR 1002 / 0.6 M S JCT 1802 STEEL PLANK FLR ON I BEAMS

Bed- To Crown 24' (H2O = 1' Deep) Prior Survey N/A BUILT: 1974

Downstream Structure LARGE DAM LAT: -81.423802

Location 0.4 M D/S ALONG IE LONG: 35.820282

Bed- To Crown N/A Prior Survey N/A BUILT: UNKNOWN

LAT: 35.804153

LONG: -81.427180

ENVIRONMENTAL

TVA: NO

Trout Stream NO Anadromous Fish NO Primary Nursery Area NO

High Quality Waters NO Nutrient Sensitive Waters NO

Near Water Supply Intake NO CAMA County NO

Stream Classification WS-IV

DENR River Basin Info. CATAWBA STREAM #: 03-08-32

1,101, 107, 180,

u/s 57

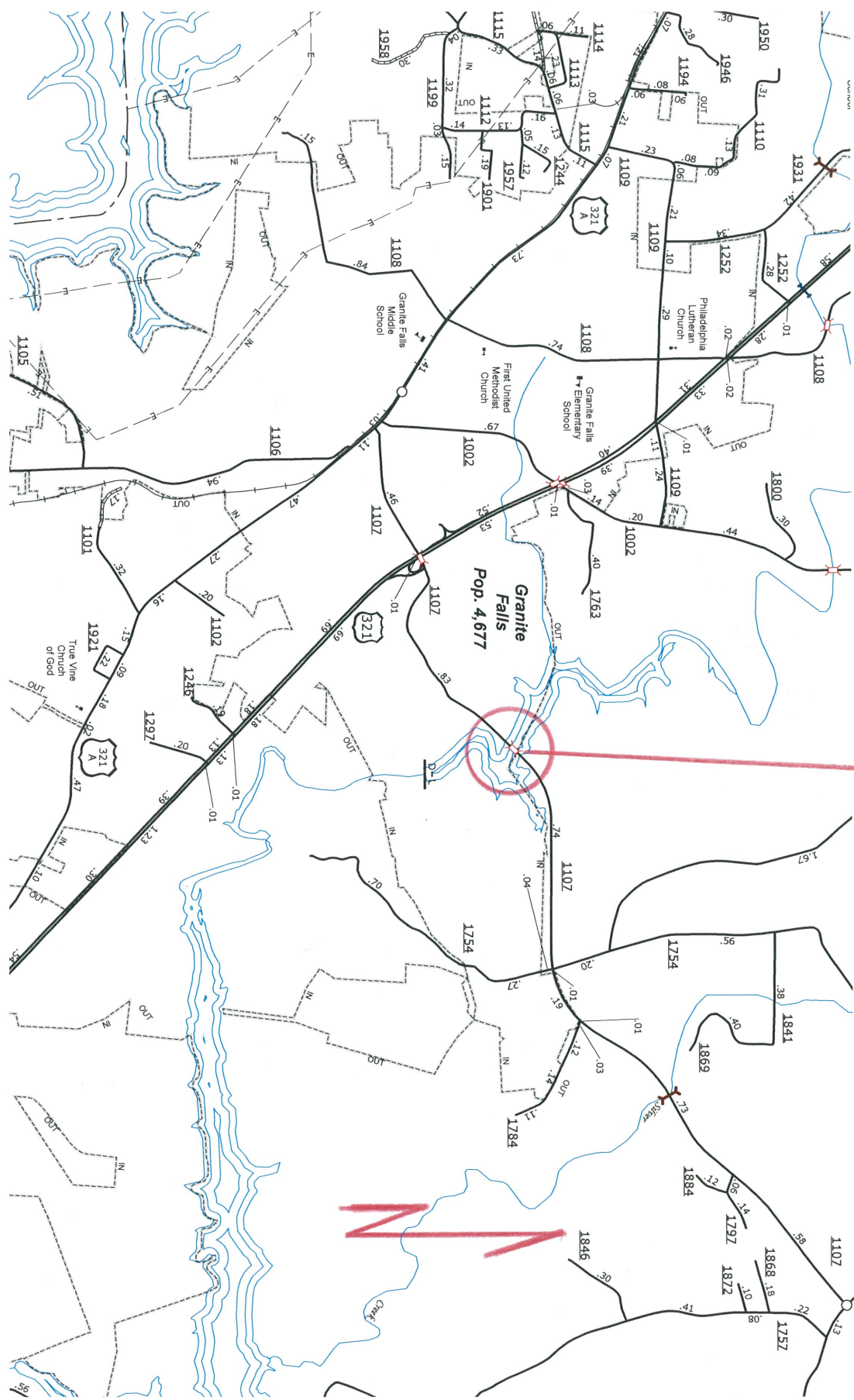
COPIES OF THIS MAP ARE AVAILABLE TO THE PUBLIC AT NOMINAL COST. NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, 1000 SOUTH TRYON STREET, RALEIGH, NC 27603.

The MTA's goal is to provide the most accurate and current information possible. New data is incorporated from numerous sources with varying rates of publication and may include inaccuracies. As a result, the accuracy of the data is not guaranteed. The MTA is not responsible for any errors or omissions. The information shown on this map was last updated on September 1, 2015. For additional information, visit www.mta.com or call 1-800-444-4444.

LEGEND

- 1. INTERSTATE
- 2. STATE ROUTE
- 3. COUNTY ROUTE
- 4. LOCAL ROAD
- 5. BRIDGE
- 6. FERRY
- 7. TUNNEL
- 8. RAILROAD
- 9. AIRPORT
- 10. MARINA
- 11. LAKES
- 12. RIVERS
- 13. CREEKS
- 14. SWAMP
- 15. WETLANDS
- 16. FOREST
- 17. PASTURE
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130262



#262

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130262

Click on a tool on the toolbar. If the icon remains
selected, click on the map to perform the desired
action.

NC Map Layers

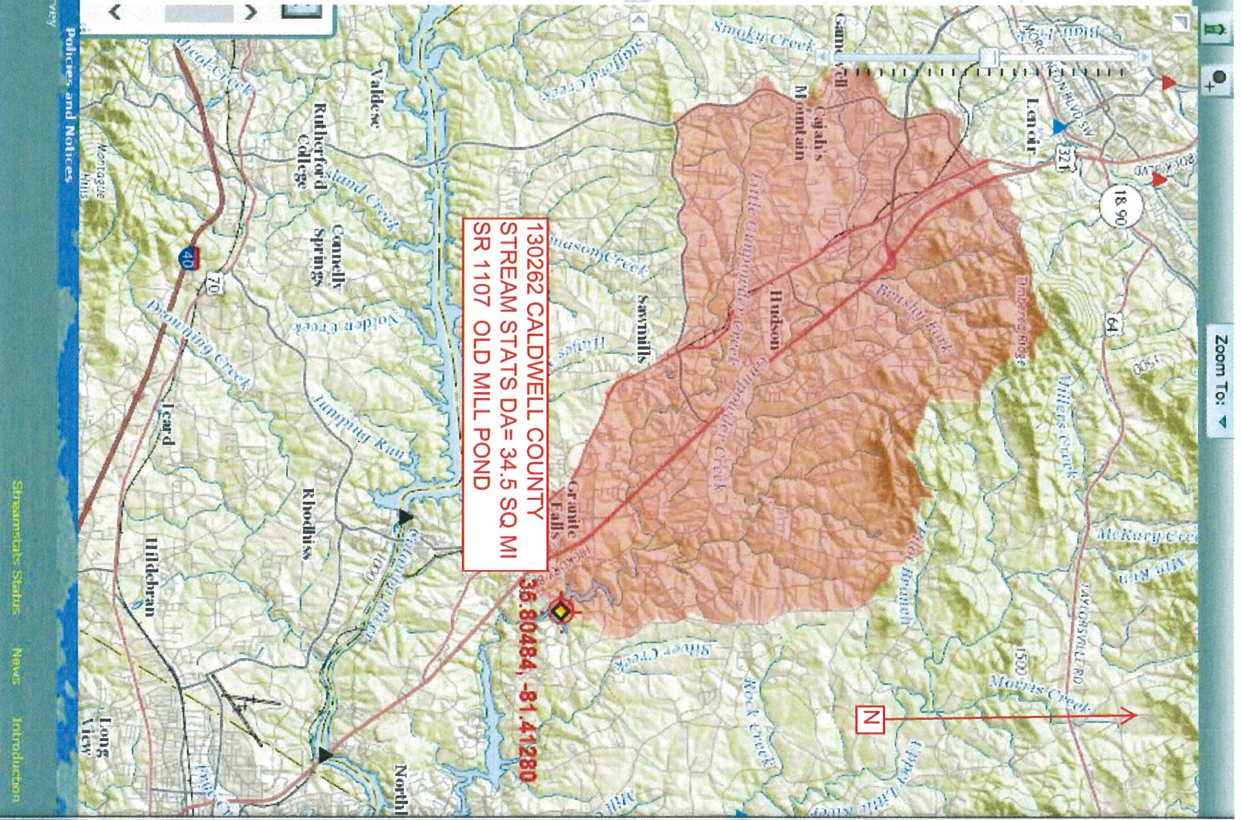
- ☒ Streamgages
- ☒ Area of limited functionality
- ☒ North Carolina
- ☒ Stream Grid
- ☒ Study Area Bndys

- ☐ Base Layers
 - ☐ Imagery
 - ☐ Street Map
 - ☐ World Topo
 - ☐ USA Topo
 - ☐ Canadian Topo
 - ☒ TMI Topo

Scale: 1 : 144,448
altitude: 35,70787
longitude: -81.53649
SS



Accessibility: EOIA Privacy
U.S. Department of the Interior | U.S. Geological Survey
Help Contact Information: StreamStats Help
Use: Last Modified



Date: Fri Oct 14, 2016 7:20:01 AM GMT-4
Study Area: North Carolina
NAD 1983 Latitude: 35.8049 (35 48 18)
NAD 1983 Longitude: -81.4126 (-81 24 46)
Drainage Area: 34.5 mi2

Peak Flows Region Grid Basin Characteristics

100% Peak Southeast US over 1 sqmi 2009 5158 (34.5 mi2)			
Parameter	Value	Regression Equation Valid Range	
Drainage Area (square miles)	34.5	Min	Max
Percent Area in Region 1 (percent)	91.889	0	9000
Percent Area in Region 2 (percent)	8.111	0	100
Percent Area in Region 3 (percent)	0.000	0	100
Percent Area in Region 4 (percent)	0.000	0	100
Percent Area in Region 5 (percent)	0.000	0	100

Urban Flows Region Grid Basin Characteristics

Area in square miles-34.5			
Percent Imperviousness of basin area 2006 NLCD-8.21			
Percentage of Impervious area determined from NLCD 2011 Impervious dataset-8.38			
92% Region 1 Urban over 3 sqmi 2014 5030 (31.7 mi2)			
Parameter	Value	Regression Equation Valid Range	
Drainage Area (square miles)	34.5	Min	Max
Percent Impervious NLCD2006 (percent)	8.21	0	47.9
8% Region 2 Urban Blue Ridge F5007.00 (2.8 mi2)			
Parameter	Value	Regression Equation Valid Range	
Drainage Area (square miles)	34.5	Min	Max
Percent Impervious NLCD2011 (percent)	8.38	2	54.6

Peak Flows Region Grid Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
PK2	1590	f3/5	35		Min	Max
PK5	2740	f3/5	34		1590	4710
PK10	3570	f3/5	35		2040	6240
PK25	4640	f3/5	38		2560	8400
PK50	5570	f3/5	40		2980	10400
PK100	6420	f3/5	42		3320	12400
PK200	7250	f3/5	44		3620	14500

130262



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: Newly Structurally Deficient, Snooper, Priority Maintenance

Structure Safety Report

Routine Element Inspection - Contract

COUNTY: CALDWELL STRUCTURE NUMBER: 130262 FREQUENCY: 24 MONTHS

FACILITY CARRIED: SR1107 MILE POST: _____

LOCATION: .7 MI.W.JCT.SR1754

FEATURE INTERSECTED: OLD MILLPOND

LATITUDE: 35° 48' 17.1" LONGITUDE: 81° 24' 46.19"

SUPERSTRUCTURE: REINFORCED CONCRETE FLOOR ON I-BEAMS

SUBSTRUCTURE: E.BT.1:RC SPILL THRU;E.BT2&BTS:RC CAPS/TIMBER PILES

SPANS: 2 @ 40'-3;6 @ 40';4 @ 20'

☐ FRACTURE CRITICAL ☐ TEMPORARY SHORING ☐ SCOUR CRITICAL ☐ SCOUR PLAN OF ACTION

PRESENT CONDITION: Poor INSPECTION DATE: 02/22/2016

POSTED SV: 23 POSTED TTST: 31

OTHER SIGNS PRESENT: None



Looking East

Sign noticed issued for		Number Required
NO	WEIGHT LIMIT	0
NO	DELINEATORS	0
NO	NARROW BRIDGE	0
NO	ONE LANE BRIDGE	0
NO	LOW CLEARANCE	0

INSPECTED BY Cesar O Cuevas	SIGNATURE <i>Cesar O. Cuevas</i>	ASSISTED BY Nehemiah J Mabry
--------------------------------	-------------------------------------	---------------------------------

130 262

Structure: 130262

County: CALDWELL

Date: 02/22/2016

Structure Photos



End Bent bearing (Beam 3, End Bent 1 shown)



North profile, looking South

BRIDGE MANAGEMENT UNIT

130262

DATA ON EXISTING STRUCTURE

Run Date: 08/24/2016

COUNTY : CALDWELL DIVISION : 11 DISTRICT : 2 STRUCTURE NUMBER : 130262 LENGTH : 401 FEET

ROUTE CARRIED : SR1107 FEATURE INTERSECTED : OLD MILLPOND

LOCATED : .7 MI.W.JCT.SR1754 BRIDGE NAME : CITY : GRANITE FALLS

FUNC. CLASS : 17 SYST.ON : FA SYST.UNDER : NFA ADT & YR : 5300 2013 RAIL TYPE : LT 233 RT 233

BUILT : 1949 BY : SHPWC PROJ : 8-7-69-15 FED.AID PROJ : DESIGN LOAD : H 15

REHAB : BY : PROJ : ALIGNMENT : TAN SKEW : 90 LANES : ON 2 UNDER 0

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 28 FT WATER DEPTH : 15 FT

SUPERSTRUCTURE : REINFORCED CONCRETE FLOOR ON I-BEAMS

SUBSTRUCTURE : E.BT.1:RC SPILL THRU;E.BT2&BTS:RC CAPS/TIMBER PILES

SPANS : 2 @ 40'-3;6 @ 40';4 @ 20'

BEAMS OR GIRDERS : SPNS1,2,4,6,8,10,11,&12:4LNS24 I-BMS;SPNS3,5,7,&9:4LNS16 I-B

FLOOR : 5.75 RC/NO AWS ENCROACHMENT : DECK (OUT TO OUT) : 24.5 FT

CLEAR ROADWAY : 22 FT BETWEEN RAILS : 24 FT SIDEWALK OR CURB : LT 1 FT RT 1 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-10 OPE.RTG. : HS-18 CONTR.MEMBER : IntBms SpC,Pile2 Bent9 POSTED : SV 23 TTST 31 DATE 09/30/2008

SYSTEM : Secondary S.R. Route GREEN LINE ROUTE : N

UNDER ROUTES AND CLEARANCES

REMARKS :

130262

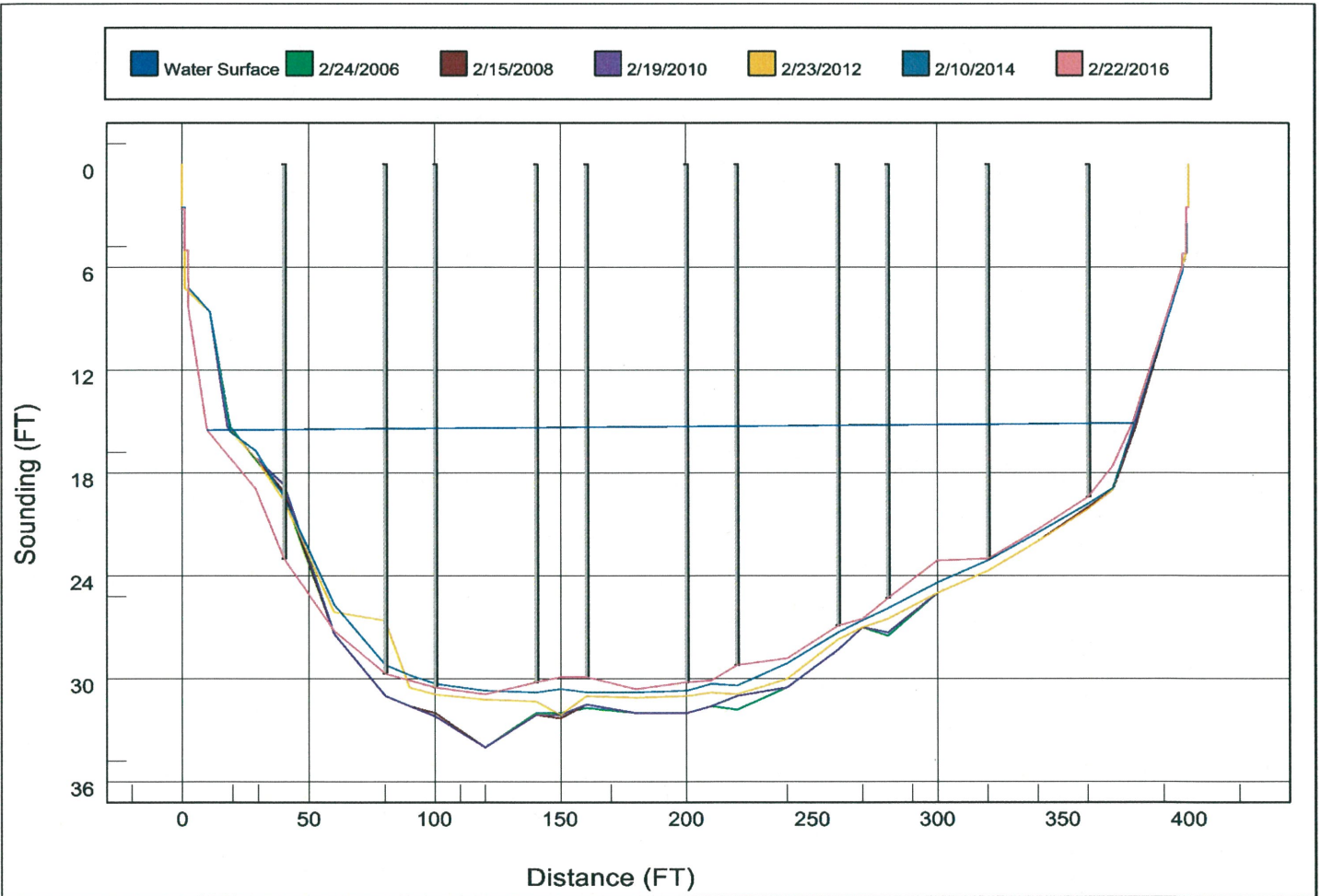
Bridge: 130262

County CALDWELL

Date: 02/22/2016

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



130262

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



NCDOT UNITS:
 BRIDGE MAINTENANCE UNIT
 HYDRAULIC DESIGN UNIT
 GEOTECHNICAL UNIT
 STRUCTURE DESIGN UNIT
 SOILS AND FOUNDATION SECTION

* Full Scour Report
 AVAILABLE IN HYDRAULICS
 UNIT SCOUR FILES
 10-14-16

BRIDGE SCOUR REPORT

COUNTY: CALDWELL BRIDGE: 262 ROUTE: SR 1107 STREAM CROSSED: GUNPOWDER CREEK

ASSESSMENT ☒ EVALUATION ☐ BY: K-H DATE 4/8/98

FHWA STRUCTURE INVENTORY & APPRAISAL CODES:

SUBSTRUCTURE CONDITION (ITEM 60) _____
 CHANNEL AND CHANNEL PROTECTION (ITEM 61) _____
 WATERWAY ADEQUACY (ITEM 71) _____
 SCOUR CRITICAL BRIDGES ((ITEM 113)) 8

MONITORING:

PLAN REQUIRED? YES _____ NO ☒

FLOOD MONITORING EVENT : (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

CRITICAL MONITORING DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

CRITICAL HIGH WATER DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

SCOUR CRITICAL DEPTHS(UPSTREAM FACE, FROM TOP OF RAIL):

B-1 = 28' / B-8 = 34' / B-9 = 30' / B-10 = 29' / B-11 = 25'
 REQUIRED ACTION: NOTIFY HYDRAULICS UNIT FOR FURTHER ANALYSIS

INCREASE UNDERWATER INSPECTION CYCLE? YES _____ NO ☒ FREQUENCY _____

COUNTERMEASURES:

PLAN REQUIRED? YES _____ NO ☒
 SUMMARY OF PLAN: _____

CONSTRUCTION COMPLETED DATE _____

FINAL CODING AFTER WORK IS COMPLETED (ITEM 113) _____ DATE _____

BRIDGE MAINTENANCE COMMENTS:

CHECK SCOUR CRITICAL ELEVATIONS AT REGULAR BRIDGE INSPECTIONS

130262

Drainage Area 36 sq. mi. Obtained from Soil Map

Character of Drainage Area Hilly
State whether level, rolling, hilly, mountainous, sandy, clay, wooded, cultivated, etc.

Waterway Required by Formula 1520 sq. ft. Formula Used Tal. C-28

Based On All Available Data, Waterway Area Considered Necessary sq. ft.

Waterway Area Provided by Recommended Structure sq. ft.

Other Information: Give Here any Additional Information which has bearing on the size of structure required.

Date on Existing Structure 12 @ 20' & 10 @ 28' C.H.C. spans on RC piers
of Oak Dam. Spilling under bridge, 140' x 7' = 980' x 1'
Bridge # 96

Character of Water in Stream Fresh
State whether fresh, salt, brackish or contains any acid or other material harmful to concrete.

Are Marine Borers Evident at any Structures in Vicinity? No.

Method Used in Determining Foundation Material 1 1/2" diam rods

Do You Consider This Information Reliable? Yes
If not, state by what means you consider accurate information can be obtained.

Additional Foundation Information Obtained by _____ Date _____

Method Used _____ Is This Satisfactory? _____

Description of Foundation Material _____

GUNPOWDER CR

BR# 262

13 0262 1948 NO TIP STA. 1740 GUNPOWDER CR CO RD
 WO. 8-7-69-15 PG. 1 PDF

BRIDGE SURVEY REPORT

BRIDGE DEPARTMENT
 N. C. STATE HIGHWAY & PUBLIC WORKS COMMISSION
 RALEIGH, N. C.

B.S. 8-7-69-15

PROJECT NO. 8-262

CALDWELL COUNTY

STA. 1740

DGE OVER GUNPOWDER CREEK Known as

B.S. 262

Route No. Ca Rd. between Granite Falls and Grace ChapelRecommended Structure 2640' 20'-40'-20'-40'-20'-40'-20'-30'-40'Recommended Width of Roadway 22' Skew 90°

Additional Recommendations:

Temporary Crossing 15 not regd. Use EXIST bridge which belongs to power co. After use as Temp. Cross. will be maintained by power co. per Div. Engr.

Present Structure

New Location is + 16.00' Up Down Stream from Crossing on Present RouteNearest Shipping Point Granite Falls On Cr. Rd. R. R.Distance from Shipping Point to Bridge Site is + 1/4 mile miles.Elevations From B. M. Nail in hole 12' cat 175 ft sta. 15+80 Elev. 861.80

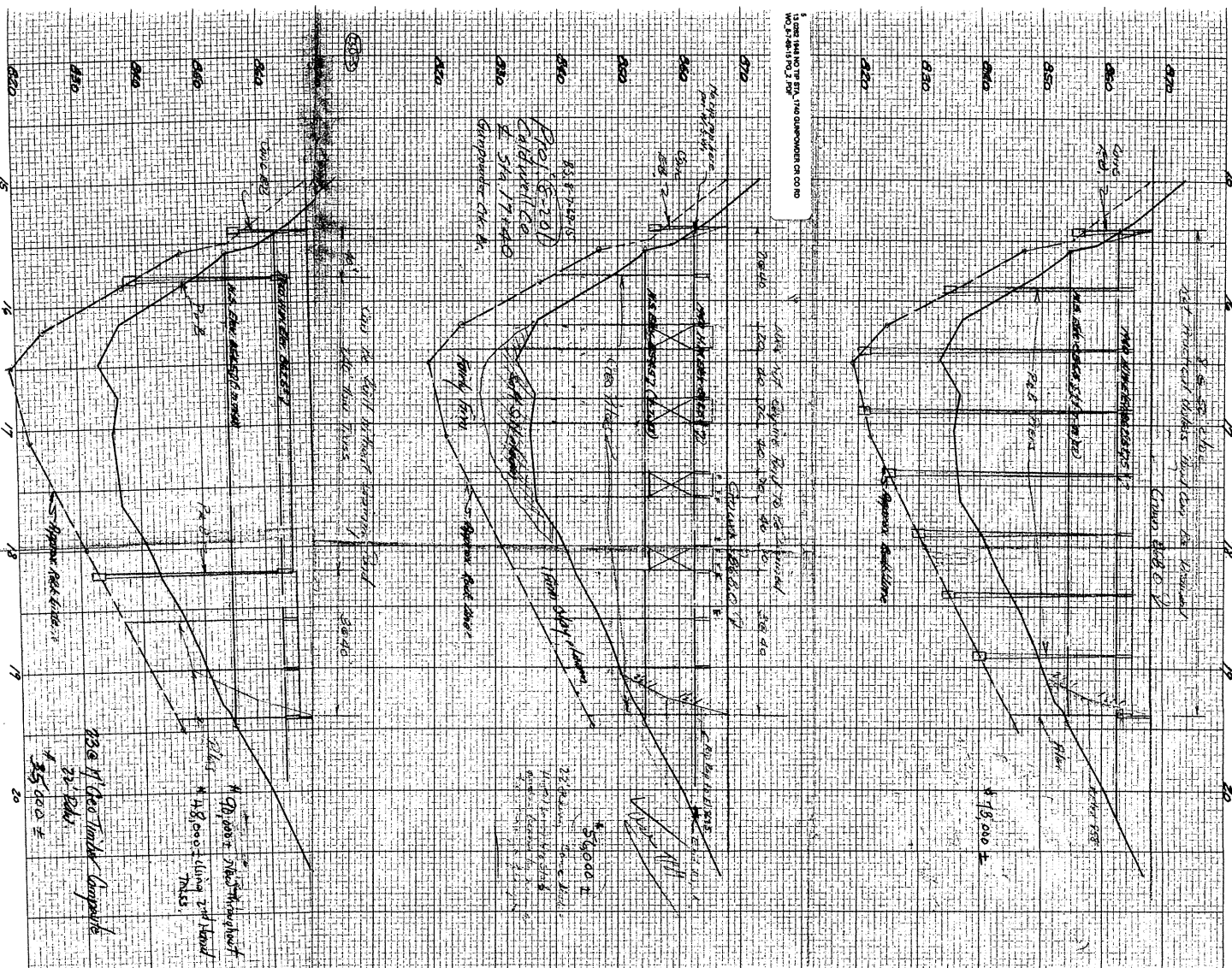
USE THIS SPACE FOR PHOTOGRAPH
 OF PROPOSED SITE, SHOWING CENTER LINE, DIRECTION OF FLOW
 AND OTHER IMPORTANT POINTS ON
 PHOTOGRAPH.

Surveyed by L. D. Duncan Assisted by Cole & Collins Date 7-7-48

(2306)

STANDARD STANDARD NUMBER
ACQ. U.S. PAT. OFF.
CROSS SECTION 10 X 10
100% RAG PAPER
MADE IN U.S.A.

KEUFFEL & ESSER CO.



130262

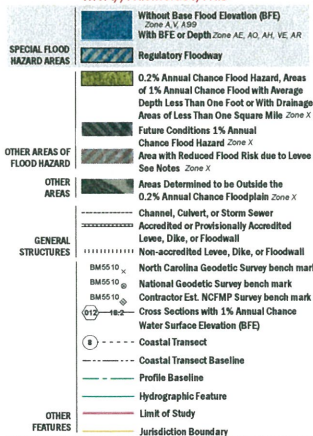


#262

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the risk associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperative Technical State Agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTP://FRIS.NC.GOV/FRIS](http://FRIS.NC.GOV/FRIS)



NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products of this National Flood Insurance Program in general, please visit the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-368-2622) or visit the FEMA Map Service Center website at www.fema.gov. For accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revision portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at <http://www.ncfloodmaps.com> or contact the FEMA Map Service Center.

Communities seeking land use and adjacent FIRM panels must obtain a current copy of this adjacent panel as well as the current FIRM panel. These maps are ordered directly from the Map Service Center at the location listed above.

For community and out-of-state map data refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-455-6243.

Base map information shown on this FIRM was provided in digital format by the North Carolina Floodplain Mapping Program (NCFMP). The source of this information can be determined from the metadata available in the digital FIRM database and in the Technical Support Data Handbook (TSDB).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA website at www.fema.gov.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a provisionally accredited (levee (PAL)) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.12 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.12 requirements, FEMA will remove the flood hazard and the information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA website at www.fema.gov.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LMWA). The LMWA represents the approximate landward limit of the 1-foot flooding zone. The effects of wave hazards between the VE Zone and the LMWA (in between the shoreline and the LMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

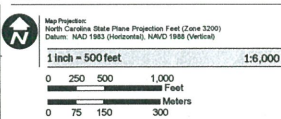
Limit of Moderate Wave Action (LMWA)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE

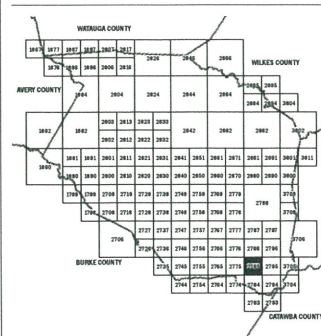
This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for properties that are totally built or substantially improved on or after the date(s) indicated on the map. For more information on the CBRS and how to determine if a property is within the CBRS, visit the FEMA website at www.fema.gov or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-364-6462.

CBRS Area Otherwise Protected Area

SCALE



PANEL LOCATOR



National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
NORTH CAROLINA
Panel 2785

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
CALDWELL COUNTY	370039	2785	J
GRANITE FALLS TOWN OF	370414	2785	J

MAP NUMBER
3710278500J
MAP REVISED
7/1/2009

#262

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GunpowderC Plan: Detailed Study 5/3/2006
 Bridge 37027-0294 SR-1107/Falls Ave

